

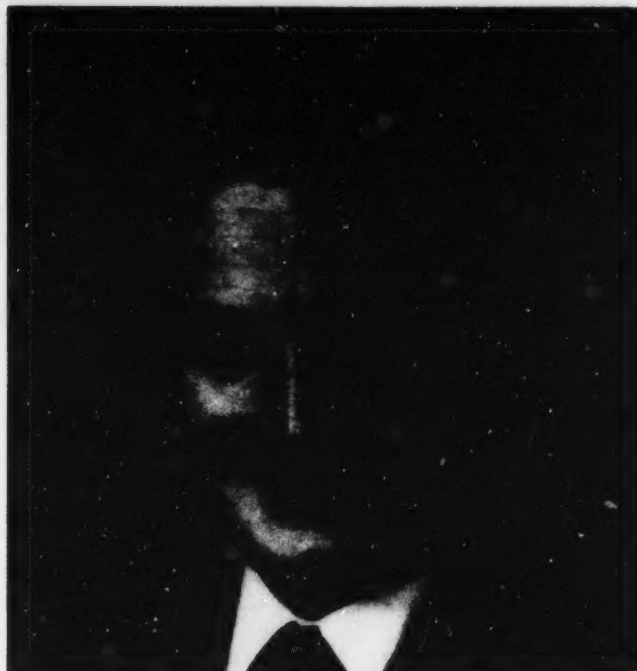
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Heritage Fund

CHAIRMAN'S REPORT



I am pleased to present the fifth annual Progress Report of Alberta's Farming for the Future program, which covers the operating year April 1, 1983 to March 31, 1984.

Farming for the Future is a far-reaching agricultural research program designed to improve net farm income and the long-term viability of the agriculture industry in Alberta. The program began full-scale operation in 1979, with a five-year mandate and a \$10 million allocation from the Alberta Heritage Savings Trust Fund; in 1980, an additional \$15 million were allocated by the Heritage Fund to expand the program's research support efforts during its initial mandate.

Although that mandate expired with the end of fiscal 1983-84, I am pleased to report that in the fall of 1983 the Alberta Legislature approved a new three-year mandate for the program and allotted \$5 million in new funding for 1984-85. Funding for succeeding years is subject to further approval.

The original purpose of Farming for the Future — to support research beneficial to agriculture in Alberta — is being maintained in the new mandate. However, in line with the fiscal restraint being exercised in all areas of government, a number of operational changes are being made in the program during its second term.

Among these changes is the institution of an overall requirement for researcher accountability as a prerequisite for support under the Research Program. Awards are also being restricted to projects conducted within Alberta, with the exception of projects requiring facilities that are not available in the province.

In addition, since the subjects of most graduate student research are already under study in the Research Program, the Graduate Student Research Support Program has not been extended into the second mandate. Funding for the highly successful On-Farm Demonstration Program, however, has been increased. These changes were made following an intensive reassessment of the program, and will, I believe, allow us to make the best possible use of the dollars we invest in agricultural research.

Receiving a second mandate represents a major achievement for Farming for the Future. Despite the heavy emphasis on fiscal restraint in government, eliminating this significant source of support for agricultural research would have represented a considerable setback to improving farm technology in the province. The approval of a new mandate for Farming for the Future reflects, I believe, not only the successes achieved by the program but also the Alberta Government's recognition of agriculture as a cornerstone of social and economic life in the province.

There can be no doubt that agricultural research plays a vital role in efforts to improve the industry. To remain competitive, the agricultural sector must receive a continuous input of new knowledge and new technology, and this is especially important today, as Alberta's agricultural industry becomes increasingly international in scope.

For this reason, improving the process of transferring technology from the laboratory to the field became a major priority for Farming for the Future over the course of its first mandate. While there is certainly room for improvement, the continued success of the On-Farm Demonstration Program is proving the gap between researcher and producer can be closed so long as there are effective vehicles for actually demonstrating and testing new technology.

In 1983-84, Farming for the Future supported almost \$7.5 million in agricultural research. This funding was divided as follows: \$7,042,460 in grants to 142 new and renewed projects under the Research Program, \$270,600 in support of 72 On-Farm Demonstration projects, and \$113,624 in awards to 19 projects in the Graduate Student Research Support Program.

In all, some 343 projects — 199 in the Research Program, 107 in the On-Farm Demonstration Program, and 37 under the Graduate Student Research Support Program — received a total of \$22,457,604 over the course of the original (1979-84) mandate.

All Research Program projects supported by Farming for the Future ended with the expiry of the first mandate, on March 31, 1984.

Farming for the Future is administered by the Agricultural Research Council of Alberta (ARCA). As Chairman of the ARCA, I am grateful for the assistance of the distinguished scientists, producers, legislators and public sector managers who make up the Council, and whose knowledge, talent, and expertise have been vital to the continued success of the program.

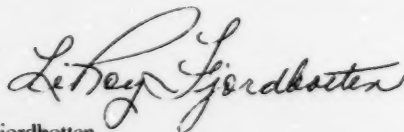
There have been a few changes in the Council's membership during the past year, and I wish to extend special thanks to the three members, Dr. G.G. Cloutier, Mr. Mel Richards, and Mr. C.S. (Johnny) Vos, who have completed their terms in office.

Mr. Vos, who runs a grain operation near Keg River, and Mr. Richards, who operates a mixed farm near Olds, are both strong proponents of agricultural research in Alberta. Their efforts as Council members were greatly appreciated, and their experience and advice will be missed by the ARCA.

Dr. Cloutier, as president of the Alberta Research Council and a member of the ARCA, has made a worthy contribution to both the scientific and agricultural communities of our province. His service on the ARCA is only one facet of a long and distinguished career, and on behalf of all Council members, I extend to Dr. Cloutier best wishes for success in all future endeavours.

I would also like to extend a warm welcome to Dr. R.W. Stewart, who replaces Dr. Cloutier as president of the Alberta Research Council and as a member of the ARCA. I'm sure Dr. Stewart will be a valuable addition to the ARCA, and I look forward to working with him in coming years.

With the close of fiscal 1983-84, everyone involved with Farming for the Future can take great pride in the program's very successful first term. Farming for the Future has made a major contribution to the advancement of agriculture in our province, and with the start of the program's new mandate, I am sure we in Alberta's agricultural industry can look forward to even greater success.



LeRoy Fjordbotten
Minister of Agriculture
Chairman, Agricultural Research Council of Alberta
September 1984

1983-84 PROGRESS REPORT

"If we are going to be competitive and be on top of the pile, then we must continue to be tops in those areas and those things that are new. Of course, they only come with research."

Honourable Dallas W. Schmidt
Former Minister of Agriculture and
Chairman of the ARCA
March 1979

Along with marketing and productive capability, research is a fundamental need of Alberta's agricultural industry.

It was the reason the Farming for the Future agricultural research program was announced in October 1977. During its 18-month start up, and the subsequent five years of its first operational mandate from April 1979 to March 1984, the program supported research in all major production sectors of Alberta's agricultural industry.

Farming for the Future completed its first mandate at the end of the 1983-84 fiscal year. During that year, \$7,042,460 were distributed in support to 142 Research Program projects, \$270,600 to 72 On-Farm Demonstration Program projects and \$113,624 to 19 projects under the Graduate Student Research Support Program. Over the entire mandate, \$22,457,604 were awarded to 199 Research Program, 107 On-Farm Demonstration Program and 37 Graduate Student Research Support Program projects — 343 projects in all.

In the fall of 1983, the Select Standing Committee on the Alberta Heritage Savings Trust Fund Act reviewed the progress achieved by the program during the first mandate. Following this review, the Alberta Legislature approved a new three-year mandate for Farming for the Future and allocated \$5 million in new funding for 1984-85. Funding for the remainder of the three-year mandate is subject to further approval by the Legislature.

The original objectives of Farming for the Future — to improve net farm income and to enhance the long-term viability of Alberta's agricultural industry — will remain the program's chief goals during the second mandate. The program will continue to pursue the advancement of agricultural technology through augmenting and complementing research carried out by private industry, provincial and federal government agencies, and universities.



ARCA Activities

The Agricultural Research Council of Alberta (ARCA) was created in 1978 for the purpose of administering Farming for the Future. Among the Council's major responsibilities are identifying Alberta's agricultural research needs and helping to ensure the continuity and expansion of agricultural research in the province. The ARCA partly meets these responsibilities through evaluating proposals submitted under the Farming for the Future Research Program. In February 1984, the Council considered 251 applications requesting a total of \$12.8 million in grants for 1984-85. Awards totalling almost \$4.4 million were approved for 102 projects.

The Council's responsibilities also include setting policies and operational procedures for Farming for the Future. For example, at its policy meeting in February 1984, the Council shifted the annual deadline for submitting applications to the Research Program from December 1 to November 1. The ARCA also approved setting aside a fund of \$50,000 per year to defray costs incurred by organizations holding agricultural research conferences in Alberta. Other subjects discussed at the meeting were procedures for handling intellectual property, means of ensuring researcher accountability, procedures for reviewing final reports from Farming for the Future projects, and methods of distributing final result information from projects.

The Council has long recognized the need to maintain public awareness of the importance of agricultural research and Farming for the Future. During 1983-84, five articles were published in the *Country Guide* magazine, each article featuring a different aspect of agricultural research being sponsored by Farming for the Future. Copies of these articles and the 1982-83 *Progress Report* were widely distributed to the public.

As well, the Farming for the Future display was set up at eight agricultural fairs, seminars and conferences throughout the province in 1983. Media attention was also received. Whether in the form of a film documentary, a television special or a general news item, this coverage helped to keep Farming for the Future in public view during 1983-84.

RESEARCH PROGRAM

The ARCA has established nine program committees to evaluate and make recommendations on proposals submitted for funding under the Research Program. The recommendations of the program committees are forwarded to the Council for consideration at its annual application review meeting.

Each committee has expertise in a specific component of Alberta's agricultural industry. The program committee names are: Cereals and Oilseeds; Crop Protection and Entomology; Forages; Irrigation; Land Resources and Engineering; Non-Ruminants; Processing, Transportation, Marketing and Socio-Economics; Ruminants; and Special Crops. Each committee has a member of the ARCA as chairman and an Alberta Agriculture representative as vice-chairman, and is composed of producers, scientists and public sector managers.

For the 1983-84 fiscal year, 142 projects were supported under the Research Program at a cost of \$7,042,460. The ARCA approved 49 new projects costing \$2.5 million; the other 93 received renewal funding. All Research Program projects initiated during the first mandate were required to end on March 31, 1984.

For the 1984-85 fiscal year, 102 new research projects were approved at a cost of approximately \$4.4 million.



RESEARCH PROJECT HIGHLIGHTS

The following section reviews only a few of the projects funded under the Research Program. A complete project list appears in the section "Research Program Project Summaries."

Cereals and Oilseeds

Cereal and oilseed crop production is a cornerstone of Alberta's agricultural industry. In 1983, Alberta producers harvested 250 million bushels (6.8 million tonnes) of wheat, 243 million bushels (5.3 million tonnes) of barley and 49 million bushels (1.1 million tonnes) of canola; farm cash receipts for cereal and oilseed production the same year were estimated at \$1.87 billion.

Because of the vital importance of these commodities, cereal and oilseed research received considerable funding from Farming for the Future in the course of the first mandate. Twenty-eight projects were awarded a total of \$5,333,600. These included studies on plant breeding, development of new crop varieties, disease and weed control, and improved methods of production.

In one of these projects, conducted at Agriculture Canada's Beaverlodge research station under the supervision of Dr. Robert Wolfe, stand establishment methods, harvesting techniques and harvesting schedules were investigated for crops grown in the Peace River region. As a result, management recommendations were developed for barley, canola, wheat and oats, which will help Peace River farmers obtain maximum benefit from improved crop varieties.

Similar trials conducted during the first mandate by researchers at Alberta Agriculture, Agriculture Canada and the University of Alberta have resulted in management recommendations for other areas of the province.

The development of superior soft white spring wheat varieties for Alberta's irrigated areas was the focus of a project managed by Dr. Julian Thomas at Agriculture Canada's Lethbridge research station.

Present soft white varieties lack resistance to leaf diseases and are highly susceptible to kernel blackpoint and untimely sprouting. Evidence assembled during the project shows that both the yield and the intrinsic quality of this crop can be improved through plant breeding.

The widespread testing system used in the study also ensures that new varieties are more broadly adapted than those licensed in the past. Material developed by Dr. Thomas during the first mandate forms the base of a new project being conducted in 1984-85.

Development of canola varieties appropriate for Alberta's diverse regions is currently a major focus for agricultural research in the province. Among the potential benefits of such research are increased yields and a wider range of cropping alternatives for producers.

One such project was conducted in 1983-84 by Drs. Keith Downey, Don Wilson and Raghavadevanahalli Sadasivaiah at Agriculture Canada research stations in Saskatoon, Lethbridge and Beaverlodge.

Development of improved canola varieties is enabling Alberta producers to adopt this oilseed as a major crop. In this picture, canola seeds are viewed through an electron microscope.

This project evaluated the environmental conditions of three Alberta regions in terms of their potential for canola production: the long day and short growing season of the Peace River region; the intensive production needs of southern irrigated soils; and the moisture and temperature stresses of southern drylands. Also examined during the study were disease problems in specific regions, and the attractiveness of various canola varieties to honey bees.

Dr. Downey and his research team will build on the information established during the first mandate through a project with similar objectives which has been awarded funds for 1984-85.

Crop Protection and Entomology

Insects can be both a disaster and a bonus for producers. While insects such as black flies, bertha armyworms and grasshoppers inflict major economic losses every year on the farming community, other insects pollinate crops and bees produce honey and beeswax.

To obtain maximum benefit from useful insects and maximum protection from harmful ones, Farming for the Future granted a total of \$1,597,025 during its first mandate to research in crop protection and entomology. In all, 13 projects were funded; topics of study ranged from bee breeding and management to insect pest control.

In support of Alberta's important honey industry, funding was allocated to a project conducted by Dr. Tibor Szabo at Agriculture Canada's research station in Beaverlodge — a project which eventually resulted in the development of the celebrated "Alberta Bee."

Two strains of the bee were, in fact, produced as a result of Dr. Szabo's work, one for northern and one for southern Alberta. Both display superior docility, overwintering ability, honey production and disease resistance. This research also resulted in the publication of 12 scientific papers relating to honey bee breeding and overwintering, and nectar and pollen production in Alberta.

Research into crop protection also received Farming for the Future support during the first mandate.



An example is a study begun in 1982 by Dr. Mary Spencer of the University of Alberta. Her research evaluated the use of ethylene and potassium nitrate to break weed seed dormancy in Alberta soils.

Results indicate that application of ethylene promotes germination of wild oats, lambs-quarter and wild mustard. Therefore, by stimulating greater germination of dormant seeds, producers could obtain maximum effect from a single herbicide application. Dr. Spencer will continue her investigations into ethylene and potassium nitrate use in 1984-85.

Forages

The total value of forage production in Alberta has an estimated annual on-farm cash equivalent of \$600 million. Of this total, tame hay, cereal silage and greenfeed account for \$416 million; forage production for pasture is worth an additional \$163 million.

During its first term, Farming for the Future supported forage research related to disease resistance and control, brush control, varietal testing, and harvest and storage techniques. In all, 32 projects were funded at a total cost of \$3,729,623.

During the first mandate, Dr. Wendell Rice of Agriculture Canada's Beaverlodge research station directed an extensive study concerned with increasing the nitrogen fixation capability of forage legumes grown in northern Alberta. Field experiments were used to evaluate legume inoculants and inoculation methods; in this way, the nitrogen fixation potential of several crops was established. In addition, laboratory testing helped develop improved techniques for evaluating inoculant quality and testing strains of *Rhizobium meliloti*, the root nodule bacterium which fixes nitrogen.

The study identified several strains of *R. meliloti* which perform well on low pH soils. As a result, two of these strains were released to inoculant manufacturers. Both are now components of an alfalfa inoculant and a coated alfalfa seed product sold in Western Canada.

In line with its objective of ensuring the long-term productivity of Alberta's forage producers, Farming for the Future has awarded 1984-85 funding to a new project being managed by Dr. Tony Chen of the Alberta Research Council.

This study is aimed at optimizing somatic embryo production in the development of artificial alfalfa seeds. New plant tissue culture techniques being studied by Dr. Chen permit alfalfa embryo formation *in vitro*. Since embryos produced by this method would be genetically identical to their parent plants, such a system could help eliminate unfavourable genetic combinations and solve the problem of diseases transmitted through cross-pollination.

New plant tissue culture techniques are being used to breed superior plants. This alfalfa embryo will germinate and develop into a plant exactly like its parent plant.

Irrigation

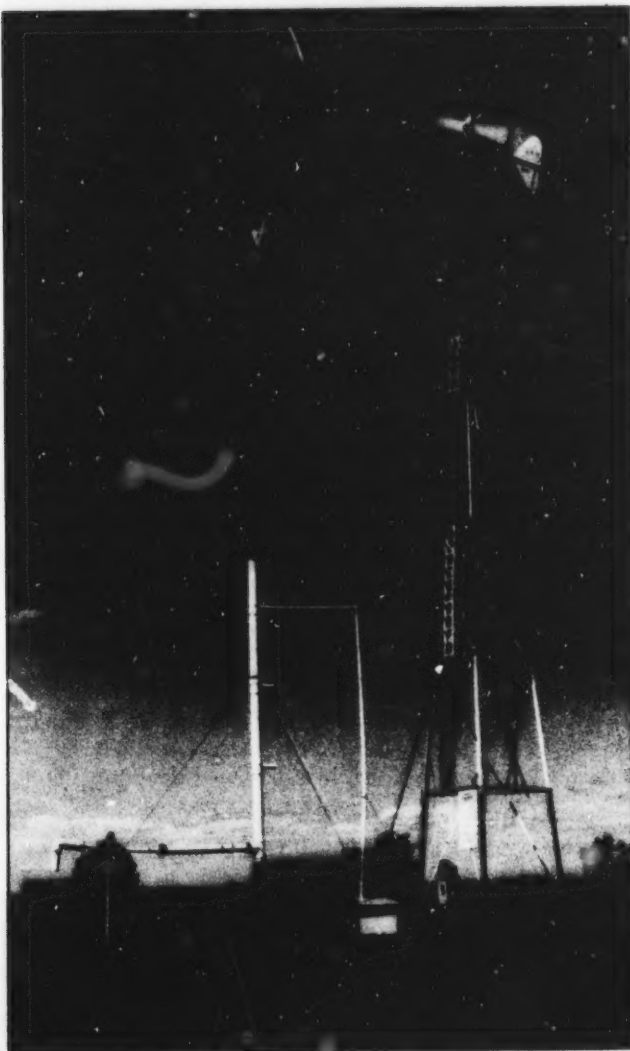
Alberta contains approximately two-thirds of Canada's total irrigated farmland; in 1983, the province's 13 irrigation districts contained more than one million irrigable acres, with 969,600 acres actually irrigated. Both irrigable and irrigated acreage are expected to increase in the future as new irrigation techniques are developed through research.

The majority of Farming for the Future's irrigation projects have been aimed at increasing water use efficiency and improving drainage to reduce damage from saline seepage. During the first mandate, seven irrigation-related projects were allocated total funding of \$460,735.

In one of these projects, directed by Eric Jensen of C.W. Farmland Reclamation Limited in Olds, a self-propelled machine was developed which installs plastic cutoff curtains without first excavating a trench. Use of the new machine eliminates the difficult task of working with the unstable soils associated with seepage conditions as well as reduces the cost of curtain installation.

In Alberta, most pumps for removing irrigation drainage effluent are electric. However, as many drainage sites are in remote areas of the province, the electricity charges often exceed the capital cost of the drainage system itself.

In response to this situation, Alberta Agriculture's Brent Paterson began a project in 1982 to evaluate the economy and efficiency of using wind turbines to pump effluent. Since that time, a number of commercial and original turbine designs have been tested. Mr. Paterson hopes to determine a practical energy alternative among the models which he will continue to study in 1984-85.



Wind turbines may be a low cost solution for driving pumps in areas where electric power installation is too expensive.





Land Resources and Engineering

Rich agricultural land is one of Alberta's greatest natural resources: today more than 58,000 farms occupy nearly 50 million acres of farmland across the province. To help maintain this vital agricultural land base, Farming for the Future spent \$2,466,205 in the course of its first mandate on 13 land-related projects focusing on soil fertility, tillage practices, moisture conservation and erosion control.

Depletion of soil nitrogen and loss of fertilizer nitrogen through leaching and conversion to nitrogen gas are major concerns in the farming sector. Alberta producers annually spend almost 11 percent of their total operating expenses on fertilizer (\$268 million in 1983); however, proper management is required to obtain maximum benefits from fertilizer application. Accordingly, between 1979 and 1984, Don Laverty of Alberta Agriculture's Soil and Feed Testing Laboratory coordinated a province-wide study to evaluate factors contributing to losses of soil and fertilizer nitrogen in cultivated fields.

The result: extensive field and laboratory research identified specific soil and climatic conditions related to nitrogen losses. Several methods of increasing nitrogen efficiency were determined; among these is deep-banding of nitrogen in late fall, rather than using the traditional methods of broadcasting and incorporation. Maximum yields and fertilizer recovery were achieved when nitrogen and phosphorus were deep-banded in fall or spring prior to seeding, a technique which is also more convenient and cost effective than the standard methods.

In a new project awarded funds for 1984-85, Richard Stein of the Alberta Research Council will undertake an hydrogeological investigation to identify problem recharge areas involved in dryland salinity.

Dryland salinity is a serious problem for southern Alberta farmers; among its effects are loss of soil productivity, seeding delays, poor soil trafficability and contamination of surface and near-surface water resources. Mr. Stein intends to develop a quantitative understanding of water and salt movement, the first step in devising methods for dealing with Alberta's problem recharge areas.



Dryland salinity has been increasing at an alarming rate in Alberta. Approximately 750,000 acres of farm land are affected to some degree by salinity problems.



Farming for the Future research on feeding requirements and disease control in poultry has helped Alberta maintain its position as a leading poultry producer in the Prairies. In 1983, Alberta's poultry and poultry products generated farm cash receipts of \$124 million.

Non-Ruminants

In 1983, Alberta's swine and poultry industries generated combined farm cash receipts of \$325 million. To support this crucial industry, Farming for the Future allocated \$1,487,010 during its first mandate for 22 projects related to swine, poultry, horse and rabbit production. These focused on reproduction, management, disease control and efficient use of various feeds and feed supplements.

One such project was conducted at Saskatoon's Veterinary Infectious Disease Organization (VIDO) under the direction of Dr. Philip Willson. The study consisted of an investigation into porcine pneumonia caused by the bacteria *Haemophilus pleuropneumoniae*. Vaccination, treatment, and serologic tests were studied, and the role of transport conditions and temperature change in precipitating pneumonia outbreaks was examined.

Through this work, recommendations for treatment of the pneumonia were developed, among them injection of long-acting antibiotics prior to exposure. A sensitive serologic test was also developed to detect exposure to the disease and to identify potential carriers. By helping to eliminate pneumonia from infected farms and to prevent introduction of exposed replacement stock, this study should yield substantial benefits to Alberta's swine producers.

In 1982, Dr. Jan van den Hurk, also at VIDO, began a study of hemorrhagic enteritis virus in turkeys. Economic losses through enteritis infection have been estimated at \$9 million annually in the Canadian turkey industry. The disease results in slower growth, lower grade meat and, in severe cases, death by intestinal hemorrhaging.

Through his Farming for the Future research, Dr. van den Hurk developed a cell culture system for laboratory growth of the virus, and has produced small quantities of the first culture-grown hemorrhagic enteritis vaccine. Further research and field testing of the vaccine will be conducted by Dr. van den Hurk in 1984-85.

Processing, Transportation, Marketing and Socio-Economics

During its first term, Farming for the Future allocated a total of \$819,960 to 16 projects in the areas of agricultural processing, marketing and socio-economics. About 40 percent of these funds were awarded to projects focusing on canola processing and marketing. They included evaluations of consumer acceptance of canola margarines, nutritional aspects of canola products, and pricing efficiencies in the canola market.

Socio-economic factors affecting Alberta producers were another major area of study during the first mandate. In 1983-84, James Copeland and his research team at the University of Alberta assessed current and potential agricultural applications of microcomputers.

In this study, which centered on use of computers for farm accounting and records, Mr. Copeland discovered that while only one percent of Alberta farmers currently own microcomputers, about 35 percent plan to purchase such equipment in future. The study also noted that adoption of computer technology for farm financial management is presently limited by a general lack of accounting and management skills among farm operators. Increased emphasis on financial management among producers and extension agents would therefore be needed to expedite the adoption process.

The development and widespread adoption of science and technology in agriculture has made producer safety an area of concern throughout the farming sector. To truly benefit Alberta producers, new chemicals and machinery must be accompanied by appropriate safety instructions for their use.

In recognition of the vital importance of farm safety, Farming for the Future has approved 1984-85 funding for a new project focusing on safety measures for pesticide users.

Through their research, Drs. Nancy Kerr and Katherine Rigakis of the University of Alberta, in conjunction with Mrs. Bertha Eggertson of Alberta Agriculture, will develop laundry procedures for removal of pesticides from clothing. As the skin is the major route by which

pesticides enter the human body, clothing contaminated with pesticide residues can cause reactions ranging from minor skin irritations to vomiting, mental confusion, difficulty in breathing, changes in heart rate, and convulsions.

On completion of their work, Drs. Kerr and Rigakis will mount a campaign to publicize the cleaning methods.

Ruminants

The ruminant industry is the second largest contributor to Alberta's total agricultural income. In 1983, farm cash receipts from ruminant production were estimated at \$1.32 billion, accounting for 35.8 percent of total farm cash receipts.

Beef cattle were the major focus of ruminant research supported by Farming for the Future during its first mandate; funding was also awarded to experiments related to dairy cattle and sheep. In all, 50 studies — ranging in subject from breeding, reproduction and nutrition to meat grading and processing — were carried out between 1979 and 1984. The total cost of these projects was \$4,870,192.

Splitting of single calf embryos to obtain identical twin offspring was the objective of a project conducted by Dr. Brian Shea of Alberta Livestock Transplants Limited, located in Calgary. As a result of Dr. Shea's research, the number of calves obtained from valuable breeding stock can now be doubled. The potential benefits of this technique for cattle producers are enormous. In addition, the information acquired in the course of this study has proven valuable in other experiments related to cloning and genetic engineering.

At the University of Alberta, a project initiated in 1982 by Dr. Larry Milligan has defined and refined a rapid, reliable, and simple technique for analyzing forage digestibility, level of voluntary forage intake, and efficiency of energy utilization in ruminants.

Dr. Milligan's method involves using nuclear magnetic resonance, a non-destructive method of chemical identification and measurement, to accurately determine the fibre constituents of forages without direct feeding. Dr. Milligan will carry out further work in this area in 1984-85. He hopes to identify forage species, systems of harvest, and feedstuff preservation and utilization practices which should be used to obtain maximum energy use by cattle.

Special Crops

Production of special crops is a growing industry in Alberta: in 1983, sales of Alberta potatoes, sugarbeets, pulses and greenhouse products totalled \$139 million, and the planted acreage of many special crops has been expanding steadily in recent years. To meet increasing local and export demands, development of this sector is both feasible and desirable.

Between 1979 and 1984, Farming for the Future provided a total of \$1,357,625 to fund 18 projects related to special crop production. Research topics included plant disease control and use of fungicide in greenhouse operations, and development of new varieties and management practices appropriate for Alberta's soil and climatic conditions.

At the Alberta Horticultural Research Center in Brooks, Dr. Ron Howard investigated the biology and control of root diseases of pulse crops in southern Alberta. This study concentrated on the effects of soil temperature, moisture and compaction, and of culturing techniques such as soil ripping and seed inoculation. Dr. Howard's findings have enabled growers to reduce disease losses in their crops.

Also in the area of special crops research, Dr. Hans-Henning Muendel conducted a plant breeding program at Agriculture Canada's Lethbridge research station. It focused on the development of soybeans for irrigated production and safflower varieties for use in Alberta's southern dryland regions.

In the course of the breeding program, early-maturing, high-oil, rust-resistant safflower lines were established, and soybean crosses incorporating the desirable traits of early maturity, high yields, high protein content, and shattering/lodging resistance were tested. Dr. Muendel will continue his research in 1984-85, and expects that his Alberta-bred soybean and safflower varieties will be released for commercial production in the near future.

In recognition of the substantial contributions of sugarbeet production and processing to Alberta's people and economy, Farming for the Future has awarded funding to a new project being initiated in 1984-85 by Dr. Peter Bergen of the Alberta Sugar Company.

Dr. Bergen will study the feasibility of using truck fillers to cushion sugarbeets during harvest — long drops into truck boxes during harvesting and handling can injure beets and increase the rate of sugar loss and mold infection. He will also study the effects of various irrigation practices on sugarbeet value. Through this Farming for the Future project, Dr. Bergen hopes to significantly increase the profitability of sugarbeet production in Alberta.

ON-FARM DEMONSTRATION PROGRAM

The Agricultural Research Council of Alberta established the On-Farm Demonstration Program in January 1982 in order to intensify and accelerate the transfer of new technology from researchers to producers. In 1983-84, 72 new and renewed projects were awarded a total of \$270,600 and one project was done at the co-operating producer's expense.

A producer or producer organization with an innovative idea for a demonstration first approaches a district agriculturist. The producer, the district agriculturist and other members of the project team (such as Alberta Agriculture specialists or other scientists and experts) develop a project proposal and submit it to one of the six regional review committees. Each regional review committee is composed of the regional director as chairman, Alberta Agriculture staff, and active producers appointed by the Minister of Agriculture.

Approvals for On-Farm Demonstration Program projects go on throughout the year. The regional review committee evaluates the proposal and forwards its recommendations to the Secretary of the Agricultural Research Council of Alberta for a final decision. Applications are evaluated on the basis of their relevance to the region's agricultural industry, the competence and experience of the project team, the commitment and abilities of the producer, the validity of the project design and the size, duration and cost of the proposed project.

The On-Farm Demonstration Program provides a means of tapping the knowledge and skills of co-operating producers for the benefit of other farmers in a region. It also develops and increases direct communication amongst researchers, specialists and producers for the benefit of all groups: the researchers and specialists become more aware of the needs and problems of producers and the producers are informed about the most recent scientific results.

Innovative cattle management techniques are being demonstrated across Alberta with the support of On-Farm Demonstration Program funds.

ON-FARM DEMONSTRATION PROJECT HIGHLIGHTS

The On-Farm Demonstration Program supports projects throughout Alberta (see map). The following are examples of some of the projects supported under the program. A complete list of first mandate projects can be found in the section entitled "On-Farm Demonstration Program Project Summaries."

The Pulse Growers Association of Alberta, Blair Roth (a special crops specialist for Alberta Agriculture) and Dr. Rob Rennie (a soil microbiologist for Agriculture Canada) are investigating inoculation of pulse crops such as dry and green peas, dry beans and lentils with "nitrogen fixing" bacteria. These bacteria take nitrogen from the air and change it into a form which plants can use, so inoculation reduces the need for nitrogen fertilizer applications.

Under greenhouse conditions, yields of inoculated pulse crops were equal to or greater than nitrogen-fertilized yields and the costs of inoculation were considerably lower than fertilizer costs. The project team is determining if the results seen in the greenhouse will be repeated on test plots on six Region I (Southern Alberta) farms and determining which of several inoculation methods will achieve the best results. Potentially, these new methods could improve productivity and decrease costs for pulse crop growers.

James Hughes of Longview and Dave Lathwell of Sundre farm in areas of known mineral deficiencies. They participated in projects designed to assess the benefits of supplementing cattle diets with trace minerals such as selenium, zinc, copper, manganese and cobalt. The improved weight gains resulting from trace mineral supplementation more than made up for the cost of the added minerals in both these projects. This appears to be a relatively inexpensive way for cattle producers in mineral deficient areas to improve productivity.



Ian and Deb Clark of Bentley are testing a lightweight, easy to assemble structure for use during the lambing season. This unit is assembled each lambing season inside the arena usually used by Deb for horse riding lessons. The unit allows a large number of ewes to be lambed at the same time and yet each lamb and ewe can get individual care. The Clarks are finding that lamb survival rates have improved while the cost of building a separate lambing barn has been eliminated.

Many farmers in Alberta are interested in reducing tillage operations because of advantages such as improved moisture and soil conservation and reduced fuel consumption. However, zero and minimum tillage may raise herbicide requirements and increase insect damage and crop disease. Whether the advantages outweigh the disadvantages depends on local conditions and so several on-farm demonstrations in different parts of Alberta (such as Stavely, Nampa, and Wainwright) are assessing zero and minimum tillage. For example, Keith Brower of Wainwright is comparing zero and conventional tillage plots in terms of emergence, yield, herbicide costs and fuel consumption. He is also evaluating zero till equipment. The results from his project will assist other farmers in his district in deciding if and how they should change to zero or minimum tillage.

Some On-Farm Demonstration projects involve novel methods of supplementing producer incomes. The Northern Alberta Wild Rice Growers Association is test seeding a number of lakes north of Lac La Biche in order to evaluate the feasibility of wild rice production. If successful, wild rice production could provide additional income

through sales of rice for human consumption and possibly through attraction of wildlife to the area for wildlife sanctuaries or improved hunting.

Ray Fausak of Evansburg is assessing round bale silage as an alternative to haying when weather conditions are poor. Silage provides better feed value than hay and there is less dependence on good weather because silaging can be done faster and can utilize wetter crops. Mr. Fausak is investigating different balers, methods of stacking bales, and types of plastic for covering the bales as well as evaluating the silage as cattle feed.

Most alfalfa seed production operations in Region VI (Peace River) have many small bee shelters with bees from each shelter pollinating only one or two acres of alfalfa. Pollination of up to eight or ten acres from a single, large shelter could save time and labour for producers. Alfalfa seed producers Bob Gartly, Nick Konopelka, Doug Roy and Raymond Wood are conducting a demonstration at Eaglesham, Rycroft, Sunny Valley and Three Creeks on the use of large shelters to house leafcutter bees that will pollinate two, four and eight acres of alfalfa. Dr. Daphne Fairey of Agriculture Canada's Beaverlodge research station is the scientific advisor. Results from the project so far indicate that bees from single large shelters may pollinate more than two acres without a significant reduction in crop or bee yields. Further work will provide the information that is required to make recommendations for economic shelter sizes in Region VI.

Alberta produces about one-third of the lambs slaughtered in Canada each year. Through its On-Farm Demonstration Program, Farming for the Future is supporting projects aimed at increasing lamb production.



Leafcutter bees are the major pollinators of alfalfa. Through the On-Farm Demonstration Program, new bee management techniques are being evaluated to improve the efficiency of this pollinating service.



LOCATION OF ON-FARM DEMONSTRATION PROJECTS

NOTE: The number of locations shown exceed the number of projects in progress due to some projects being carried out at more than one site.



THE FIRST MANDATE IN RETROSPECT

Farming for the Future was announced in 1977 as a "new investment for tomorrow's farmer." Since that time, the program has grown enormously in size and scope; it has completed its first mandate and started a second, and has generated a vast amount of research activity. However, through seven years of progress, the program's primary objectives — to improve net farm income and the long-term viability of Alberta's agriculture industry — have remained unchanged.

Farming for the Future has fulfilled these objectives by supporting agricultural research in universities, federal and provincial government agencies, and the private sector. For this purpose, three major sub-programs were created during the first mandate: the Research Program, designed to expand the store of scientific and technical knowledge applicable to Alberta conditions; the On-Farm Demonstration Program, which transferred that knowledge to producers across the province; and the Graduate Student Research Support Program, a short-term effort aimed at ensuring future expertise in the agricultural sciences.

Moneys allocated by Farming for the Future to each of these sub-programs varied widely, but in no program area was funding unlimited. Inevitably, research priorities had to be established to obtain the best return on dollars invested.

Accordingly, funding decisions were made to reflect the present and potential contributions of the research in question to Alberta's people and economy. Thus, during the first mandate, the prevailing need for study in cereals and oilseeds, ruminants, and forages meant that 24.1 percent, 22.0 percent and 16.9 percent, respectively, of Research Program funds were awarded to projects in these categories. The remaining 37 percent of these funds was divided among the other six research categories.

The projects were carried out by agencies inside and outside Alberta. Institutions receiving the largest percentages of funding under the Research Program were the University of Alberta (34.5 percent), western Agriculture Canada research stations (31.7 percent), and research facilities of Alberta Agriculture (17.1 percent). Support was also granted to other universities, colleges, provincial and private agencies in the course of the first mandate.

When the Agricultural Research Council of Alberta reviewed the first four years of Farming for the Future, it concluded that the program had indeed accomplished what it set out to do. Research had been undertaken that had produced substantial benefits for producers and consumers alike; graduate students of agricultural science had received valuable training and support; research results had been quickly and effectively transferred to producers, and had sharpened Alberta's competitive edge. In short, Farming for the Future had made a significant contribution to the well-being of Alberta's agricultural producers, present and future.

In its new three-year term, Farming for the Future will build on the solid base established during its first mandate to obtain still greater benefits for the agriculture sector. In keeping with the ideal of the Heritage Trust Fund, Farming for the Future is working to ensure a high quality of life for all Albertans.



Research supported by Farming for the Future has made a significant contribution to the well-being of Alberta's farmers, present and future.

RESEARCH PROGRAM PROJECT SUMMARIES FIRST MANDATE

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
Cereals and Oilseeds			
Regional Testing of Cereal and Oilseed Varieties in Alberta	J.H. Helm	Alberta Agriculture — Lacombe, with other agencies	821,000
Screening Winter Wheat for Resistance to Snow Mold Pathogens under Controlled Conditions	D.A. Gaudet	Agriculture Canada — Lethbridge	91,950
Utility Wheat Varietal Development Program	K.G. Briggs	University of Alberta — Edmonton	422,969
Field Trial Agronomic Research in Field Crop Production	J.H. Helm	Alberta Agriculture — Lacombe	50,000
Intensification of Breeding Barley Varieties for the Peace River Region	R.I. Wolfe	Agriculture Canada — Beaverlodge	209,525
Intensification of Rapeseed (Canola) Breeding in the Peace River Region	R.S. Sadasivaiah	Agriculture Canada — Beaverlodge	99,850
Disease Resistance Selection in Early Maturing Barley, Rapeseed (Canola) and Wheat	R.I. Wolfe	Agriculture Canada — Beaverlodge	170,930
Intensification of Wheat Breeding in the Peace River Region	R.I. Wolfe	Agriculture Canada — Beaverlodge	134,900
Development of Agronomic Packages for Barley, Rapeseed (Canola), Wheat and Oat Varieties in the Peace River Region	R.I. Wolfe	Agriculture Canada — Beaverlodge	428,500
Disease Resistance Breeding in Rapeseed (Canola)	Z.P. Kondra	University of Alberta — Edmonton	272,000
Early Maturity and Frost Tolerance of Rapeseed (Canola)	Z.P. Kondra	University of Alberta — Edmonton	154,500
Weed Control in Alberta Cropland	W.H. Vanden Born	University of Alberta — Edmonton	310,041
Canada Thistle Control	P.A. O'Sullivan	Agriculture Canada — Lacombe	128,570
Biological Evaluation of Advanced Selections of High-Lysine Barley Produced in Alberta Agriculture's Feed Grain Breeding Program	R.M. Beames	University of British Columbia — Vancouver	37,500
Field Trial Agronomic Research in Special Crop Production for Central Alberta	J.H. Helm	Alberta Agriculture — Lacombe	110,000
Expansion of Winter Wheat, Winter Triticale and Spring Triticale Breeding in Central Alberta	D. Salmon	Alberta Agriculture — Lacombe	136,000
Breeding Soft White Spring Wheats for Western Canada	J.B. Thomas	Agriculture Canada — Lethbridge	194,440
A Study of Bacterial Pod Spot and Other Diseases Caused by <i>Pseudomonas</i> sp. in <i>Brassica campestris</i>	J.N. Campbell	University of Alberta — Edmonton	63,040
Application of Haploid Technique to Barley Breeding	J. Kuspira	University of Alberta — Edmonton	136,600
Development of Hybrid <i>Brassica campestris</i> Varieties for Alberta and Northern Saskatchewan	R.K. Downey	Agriculture Canada — Saskatoon	176,185
Whole Plant Utilization of Brassicas	J.R. Ingalls	University of Manitoba — Winnipeg	51,300

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
Weed Competition with Cereal and Oilseed Crops	P.A. O'Sullivan	Agriculture Canada — Lacombe	107,300
Minimizing Herbicide Application Rates by Adding Adjuvants for Weed Control in Annual Crops	P.N.P. Chow	Agriculture Canada — Brandon	31,000
Increasing Frost Tolerance in Economic Crops by Abscissic Acid	L.V. Gusta	University of Saskatchewan Crop Development Centre — Saskatoon	30,000
Management Practices for Winter Wheat Production in Central Alberta	C.D. Caldwell	Agriculture Canada — Lacombe	37,000
Identification of Irrigation Practices that Reduce Black Point in Soft White Spring Wheat	R.L. Conner	Agriculture Canada — Lethbridge	13,500
Comparison of Zero, Minimum and Conventional Tillage Management Practices on Various Soil Types for Barley and Canola Production in the Peace River Region	G.W. Clayton	Agriculture Canada — Fort Vermilion	40,000
Acceleration of Canola Variety Development for the Peace River and Southern Alberta Regions	R.K. Downey	Agriculture Canada — Saskatoon, Lethbridge and Beaverlodge	875,000
Crop Protection and Entomology			
Alberta Bee Breeding Program	T.I. Szabo	Agriculture Canada — Beaverlodge, for the Alberta Beekeepers' Association	903,600
Insect Sex Attractant Systems to Monitor Crop Pests	J.R. Byers	Agriculture Canada — Lethbridge	201,960
Commercial Package Bee Production in Northern Alberta	H.J. Pirker	Pirker Apiaries — Debolt	17,500
Studies Toward the Prevention of Anaphylactic Sensitization to Bee Stings	M.F. David	University of Manitoba — Winnipeg	59,300
Protecting Cattle Against Blood-Sucking Flies	J.A. Shemanchuk	Agriculture Canada — Lethbridge	59,565
Development of <i>In vitro</i> Techniques for Mass Production of Infective Spores of <i>Nosema locustae</i> Canning (Microsporidia) to be Used in the Management of Grasshopper Populations	A.B. Ewen	Agriculture Canada — Saskatoon	69,400
Assessment of the Role of Plant Chemicals in Repelling and Detering Feeding of Flea Beetles	B.K. Mitchell	University of Alberta — Edmonton	26,500
Clinical and Immunological Assessment and Management of Risk in Honey Bee Sting Sensitivity	J.H. Day	Queen's University — Kingston	138,000
Damage Assessments and Control of Lygus Bugs in Canola Grown in Alberta	R.A. Butts	Alberta Agriculture — Fairview	10,500
Identification of Pest Species of the <i>Simulium arcticum</i> Complex Present in the Athabasca River and Associated Tributaries	W.S. Procnier	Agriculture Canada — Lethbridge	28,400
Microbiological Control of Western Agricultural Insect Pests by Insect Parasitic Nematodes	O.N. Morris	Agriculture Canada — Winnipeg	23,600
Feasibility Study for Control of Root Maggots (<i>Delia</i> spp.) on Canola	G.E. Ball	University of Alberta — Edmonton	30,700
Oviposition Preference and Behavior in the Bertha Armyworm	B.K. Mitchell	University of Alberta — Edmonton	28,000

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
Forages			
Evaluation of Sulphur Dioxide (SO ₂) as a Silage Preservative	G.W. Mathison	University of Alberta and Alberta Research Council — Edmonton	289,800
Viruses and Virus-Related Diseases of Forage Crops in Alberta — Evaluation and Control	C. Hiruki	University of Alberta — Edmonton	128,500
Smooth Brome-grass Breeding Program	P.D. Walton	University of Alberta — Edmonton	70,200
Alfalfa Improvement Program for Disease Resistance	C. Hiruki	University of Alberta — Edmonton	304,800
Annual Forage Crops for Alberta	W.B. Berkenkamp	Agriculture Canada — Lacombe, with several agencies	619,048
Investigation of the Properties of Liquid Silage Additives and Techniques to More Accurately Apply Additives to Forage and Silage Crops	W.H. Mains	Agriculture Canada — Lethbridge	29,200
Development of Improved Forage Crop Production, Harvesting and Utilization Techniques for the Aspen Parkland of Western Canada (and) Preservation of High Moisture Hay	S.O. Thorlacius	Agriculture Canada — Melfort	10,000
Chemical Control of Stem Eyespot of Creeping Red Fescue	J.G.N. Davidson	Agriculture Canada — Beaverlodge	126,200
Alfalfa Productivity and Yield as Affected by Management Practices and Environmental Factors	J.S. McKenzie	Agriculture Canada — Beaverlodge	139,000
Evaluation of the Nitrogen-Fixing Effectiveness of Selected Strains of <i>Rhizobium</i> and Seed Inoculation Methods for Several Forage Legumes	W.A. Rice	Agriculture Canada — Beaverlodge	123,900
A Comparison of Brush Control Methods for the Development and Maintenance of Grazing Lands	A.W. Bailey	University of Alberta — Edmonton	298,750
Effect of Fertilizer Treatments on the Nutritional Value of Forages	P.J. Martin	Norwest Feed Research Ltd. — Edmonton	73,400
Effect of Weed Control on the Establishment and Persistence of Legumes	J.R. Moyer	Agriculture Canada — Lethbridge	57,700
Agronomic Research and Regional Variety Testing of Forage Varieties Recommended in Alberta	F.M. Mederick	Alberta Agriculture — Lacombe, with other agencies	505,000
Weed Control in Forage Grasses	A.L. Darwent	Agriculture Canada — Beaverlodge	56,000
Minimizing Nitrogen Losses from Urea Applied to Grassland	M.J. Rowell	Norwest Soil Research Ltd. — Edmonton	45,000
Development of a Winter-Hardy, 'Bloat-Safe' Pasture-Type Alfalfa Cultivar for the Rancher and Farmer of Western Canada	B.P. Goplen	Agriculture Canada — Saskatoon	101,580
Stress Tolerance in Orchardgrass Breeding	E.A. Clark	University of Alberta — Edmonton	137,620
Control of Brush Regrowth by Applying Herbicide with Roller and Wick Applicators	J. Waddington	Agriculture Canada — Melfort	48,400
Chemical Control of Pasture Sage (<i>Artemisia frigida</i>)	D.R. Westerlund	Chinook Applied Research Association — Oyen	12,000

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
Use of Ethylene for Control of Germination of Dormant Weed Seeds in Alberta Soils	M.E. Spencer	University of Alberta — Edmonton	63,000
Use of Plant Growth Regulators to Improve the Quality of Forages Grown in the Peace River Region of Alberta	D.C. Buck	Fairview College — Fairview	30,500
Study of Energy Requirements of the Various Components of Forage Harvesting, Storage and Utilization Systems	E.-Z. Jan	Agriculture Canada — Melfort	64,500
Alfalfa Seed Production in the Peace River Region	D.T. Fairey	Agriculture Canada — Beaverlodge	65,250
Development of a Specialty Harvester for a Variety of Crops	F.A. Rousell	Vertec Industries Ltd. — Vermilion	35,000
Sulphur Dioxide (SO ₂) Application System	H.P. Harrison	University of Alberta — Edmonton	88,700
Role of Additives in Preservation of Hay in Central Alberta	V.S. Baron	Agriculture Canada — Lacombe	30,000
Weed Control in Alfalfa for Seed Production	J.R. Moyer	Agriculture Canada — Lethbridge	30,000
Alternative Systems of Management for Grass-Legume Forage Crops	N.A. Fairey	Agriculture Canada — Beaverlodge	33,575
Enhanced Field Drying of Alberta Forages	E.A. Clark	University of Alberta — Edmonton	42,000
<i>Rhizobium</i> Strain Selections and Improvement of Legume Inoculants for Northern Alberta	W.A. Rice	Agriculture Canada — Beaverlodge	53,000
Alfalfa Productivity as Affected by Dates of Fall Cutting Management	J.S. McKenzie	Agriculture Canada — Beaverlodge	18,000
Irrigation			
Economical and Relatively Impermeable and Durable Rigid Canal Lining for Southern Alberta Environment (A co-operative program undertaken with the Alberta Irrigation Council)	S. Jonas	Alberta Agriculture — Lethbridge and the University of Calgary — Calgary	93,000
Development of 'Optimum' Subsurface Drainage Depth and Spacing Criteria for Medium- to Fine-Textured Soils within Irrigated Alberta (A co-operative program undertaken with the Alberta Irrigation Council)	D.B. Harker	Alberta Agriculture and Agriculture Canada — Lethbridge and the University of Alberta — Edmonton	107,315
Development of a Computerized Classification System Utilizing LANDSAT Digital Data to Detect, Map and Monitor Saline/Water-logged Areas under Irrigation (A co-operative program undertaken with the Alberta Irrigation Council)	D.B. Harker	Alberta Agriculture — Lethbridge	42,000
Evaluation of Low Volume Wind Turbines for Pumping Water (A co-operative program undertaken with the Alberta Irrigation Council)	B.A. Paterson	Alberta Agriculture — Lethbridge, with other agencies	83,220
Evaluation of Cutoff Curtains for Seepage Control on Irrigation Canals in Southern Alberta (A co-operative program undertaken with the Alberta Irrigation Council)	N.E. Jensen	C.W. Farmland Recla- mation Ltd. — Olds	21,900

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
The Application of New Geophysical Instrumentation and Computer Mapping Techniques to Diagnose, Map, and Monitor Saline Soils	A.E. Osborne	Monenco Consultants Ltd. — Calgary	63,300
Farmland Drainage in Central and Northern Alberta	L.A. Leskiw M.S. Anderson	Pedology Consultants, with Marv Anderson & Assoc. Ltd. — Edmonton	50,000
Land Resources and Engineering			
Zero Tillage in Alberta	P.A. O'Sullivan	Agriculture Canada — Lacombe and Lethbridge	380,880
Making the Most of Nitrogen	D.H. Lavery	Alberta Agriculture — Edmonton, with other agencies	905,160
Development of Agricultural Subsurface Drainage Design Procedures for Alberta	H.S. Vander Pluym	Alberta Agriculture — Lethbridge, with other agencies	2,000
Fertility Management of Mixed Forage Stands	J.T. Harapiak	Western Co-operative Fertilizers Ltd. — Calgary	98,800
A Hydrologic Model for Soil/Land Management in the Peace River Region	D.S. Chanasyk	University of Alberta — Edmonton	255,200
Production Optimization on Gray Wooded Soils	J.A. Robertson	University of Alberta — Edmonton	200,000
Development of Agricultural Subsurface Drainage Design Standards for Alberta	H.S. Vander Pluym	Alberta Agriculture — Lethbridge, the University of Alberta and Agriculture Canada — Edmonton	202,000
Conservation of Land Productivity in Alberta	W.B. McGill	University of Alberta — Edmonton	170,000
Land Price Escalation in Alberta: Economic Causes and Implications	M.M. Veeman	University of Alberta — Edmonton	46,965
Slough and Wetland Management in North Central Alberta	L.P. Apedaile	University of Alberta — Edmonton	35,700
An Evaluation of the Effectiveness of Snow Management for Moisture Enhancement	D.S. Chanasyk	University of Alberta — Edmonton	6,900
Improving Phosphorus Fertilizer Recommendations	J. Ashworth	Norwest Soil Research Ltd. — Edmonton	17,600
An Investigation of Hydrogeological Processes Influencing Dryland Salinity	G.M. Gabert	Alberta Research Council — Edmonton	145,000
Non-Ruminants			
Rapeseed (Canola) Meal Studies	A.R. Robblee	University of Alberta — Edmonton	284,000
Improving Sow Productivity	F.X. Aherne	University of Alberta — Edmonton	135,750

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
Alternate Protein Sources for Swine	W.C. Sauer	University of Alberta — Edmonton	149,000
A Study of Transport Deaths in Market Weight Pigs in Saskatchewan	E.G. Clark	Western College of Veterinary Medicine — Saskatoon	6,860
Influence of Dietary Factors on the Incidence of Unexplained Rickets and Related Leg Weakness Problems in Turkeys	R. Blair	University of Saskatchewan — Saskatoon	72,000
Nutritional Studies in Horses	N.F. Cymbaluk	Western College of Veterinary Medicine — Saskatoon	63,000
Studies on the Availability of Nutrients in Feedstuffs for Poultry	A. Shires	University of Alberta — Edmonton	82,500
Effect of Dietary Fat on Skeletal Development in Broiler Chickens	S. Leeson	University of Guelph — Guelph	20,000
Implications of <i>Salmonella</i> Contamination of Poultry Meat for Poultry Producers	M.E. Stiles	University of Alberta — Edmonton	62,000
Effect of Feedlot Management on Behavior, Organ Development, Lean Tissue Growth Rate and Lean Tissue Conversion of Pigs	H.T. Fredeen	Agriculture Canada — Lacombe	78,000
Effect of Creep Feeds and Creep Feed Composition on the Economics of Rabbit Production	J.R. Hunt	Agriculture Canada — Agassiz	22,400
Purification and Characterization of Hemorrhagic Enteritis (HE) Virus in Turkeys	J. van den Hurk	Veterinary Infectious Disease Organization — Saskatoon	60,800
Diagnosis, Prevention and Control of <i>Haemophilus pleuropneumoniae</i> (Hp.) in Swine	P.J. Willson	Veterinary Infectious Disease Organization and the Western College of Veterinary Medicine — Saskatoon	101,000
Potential for Improving the Productivity of Breeding Gilts	R. Blair	University of Saskatchewan — Saskatoon	74,000
Evaluation of the Nutritive Value of Commonly Used Feedstuffs for Horses in Western Canada and the Effect of Cold on Nutrient Utilization	W.C. Sauer	University of Alberta — Edmonton	35,000
Effects of Level of Feeding on Sow Lactation Performance and Postweaning Reproductive Performance	F.X. Aherne	University of Alberta — Edmonton	35,000
A Study of Heat and Moisture Loads and Air Quality in Commercial Poultry Rearing and Breeding Facilities	J.B. McQuitty	University of Alberta — Edmonton	45,000
Effects of Calcium and Phosphorus Levels in the Diet on the Incidence of Leg Weakness in Swine	F.X. Aherne	University of Alberta — Edmonton	25,000
Search for Factors Associated with Acute Death Syndrome and Twisted Leg in Broiler Chickens in Western Canada	C. Riddell	Western College of Veterinary Medicine — Saskatoon	28,700
Nutritional, Pharmacological and Environmental Effects on Gonadotrophic Hormone Release and Puberty in Gilts	R.J. Christopherson	University of Alberta — Edmonton	25,000
Development of an ELISA for the Serodiagnosis of Porcine Mycoplasmal Pneumonia	G.W. Stemke	University of Alberta — Edmonton	30,000
Amino Acid Nutrition in Swine	W.C. Sauer	University of Alberta — Edmonton	52,000

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
Processing, Transportation, Marketing and Socio-Economics			
Rapeseed (Canola) Oil: Consumer Aspects of Refined Products	F.M. Vaisey-Genser	University of Manitoba — Winnipeg	84,560
Farm Management Field Laboratory	L. Bauer	University of Alberta — Edmonton	182,250
Utilization of Low Erucic Acid-Type Rapeseed (Canola) Oil as a Dietary Fat	M.T. Clandinin	University of Toronto — Toronto	164,700
Improvement of Shelf Life of Bakery Products with Gas Packaging Technique and Preservatives	B. Ooraikul	University of Alberta — Edmonton	72,000
Compositional Analysis of Alberta Honeys	P. Sporns	University of Alberta — Edmonton	29,200
Interesterification of Canola Oils	N.A.M. Eskin	University of Manitoba — Winnipeg	11,350
A Study of an Improved Canola Extraction Process	J.A. Blake	POS Pilot Plant Corporation — Saskatoon	35,000
Utilization of Egg Lipid in Infant Formulas	M.T. Clandinin	University of Toronto — Toronto	61,200
A Study of Basis Behavior in the Western Canadian Canola Market	C.A. Carter	University of Manitoba — Winnipeg	10,500
Evaluating Debt Contracts for Alberta Farmers	R.G. Aukes	University of Manitoba — Winnipeg	19,000
Engineering Development and Economic Analysis of the Dehydrocooling Process	M. LeMaguer	University of Alberta — Edmonton	34,000
Analysis of Terramycin (Oxytetracycline) in Honey	P. Sporns L. Roth	University of Alberta and Alberta Agriculture — Edmonton	31,200
Pricing Efficiency of the Rapeseed Futures Market	M.M. Veeman	University of Alberta — Edmonton	17,000
Productivity Growth in Western Canadian Agriculture: Empirical Measurement, Underlying Causal Influences and Policy Implications	T.S. Veeman	University of Alberta — Edmonton	21,950
Effects of Changes to Statutory Freight Rates on the Structure of Cereal Agriculture in Alberta	L.P. Apedaile	University of Alberta — Edmonton	26,800
An Assessment of Current On-Farm Computerized Record Keeping and the Potential for Expansion	J.H. Copeland L. Bauer	University of Alberta — Edmonton	19,250
Ruminants			
Evaluation of Rapeseed (Canola) Meal in Protected Fat as a Supplement for Lactating Dairy Cattle	J.J. Kennelly	University of Alberta — Edmonton	21,700
Cattle Adaptability	R.J. Christopherson	University of Alberta — Edmonton	75,000
Evaluation and Improvement of the Nutritive Value of Alberta Forages	L.P. Milligan G.W. Mathison	University of Alberta and Alberta Agriculture — Edmonton	353,000

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
Effect of Stress on Animal Production	R.J. Christopherson	University of Alberta — Edmonton	120,000
Beef Cattle Breeding for Productive Efficiency	R.T. Berg	University of Alberta — Edmonton	272,100
Quality Evaluation of Beef	Z.J. Hawrysh	University of Alberta — Edmonton	143,860
Beef Cattle Growth and Carcass Research	M.A. Price	University of Alberta — Edmonton	246,300
Intensification of Production by Management of Reproduction in Sheep: Basic and Applied Studies of Seasonal Constraints to Reproduction in the Ewe	N.C. Rawlings	Western College of Veterinary Medicine — Saskatoon	98,200
Infectious Bovine Rhinotracheitis (IBR) — <i>Pasteurella haemolytica</i> Induced Respiratory Disease	L.A. Babiuk	Western College of Veterinary Medicine — Saskatoon	257,250
Stable Toxin (ST) Vaccine	C.H. Bigland	Veterinary Infectious Disease Organization — Saskatoon	16,300
Rotavirus Vaccine Project	S.D. Acres	Veterinary Infectious Disease Organization — Saskatoon	128,000
Reproductive Function of the Beef Bull: Studies of the Growing Bull Calf and Abnormal Adults to Investigate the Control of Sperm Production, Fertility and Reproductive Performance	N.C. Rawlings	Western College of Veterinary Medicine — Saskatoon	92,640
Gonadotrophin Receptors in Preovulatory Follicles and Luteal Tissue at First Ovulation in Beef Cows	J.G. Manns	Western College of Veterinary Medicine — Saskatoon	139,450
Extra Low Voltage (ELV) Electrical Stimulation of Beef Carcasses Using a Rectal Electrode System	F.H. Wolfe	University of Alberta — Edmonton	46,000
Evaluation of Dehydrated Alfalfa and Other Rumen Protein By-Pass Sources as Protein Supplements for Lactating Dairy Cattle	J.J. Kennelly	University of Alberta — Edmonton	180,388
Maternal Recognition of Pregnancy in Cattle	P.F. Flood	Western College of Veterinary Medicine — Saskatoon	66,000
Mineral Metabolism of Cattle	M.E. Smart	University of Saskatchewan — Saskatoon	90,000
Toxicological Evaluation of Cereals Contaminated with Ergot	H.B. Schiefer	Western College of Veterinary Medicine — Saskatoon	86,240
Improvement of Feed Efficiency of Ruminants by Chemical Manipulation of Rumen Fermentation <i>In vivo</i> and <i>In vitro</i>	K.-J. Cheng	Agriculture Canada — Lethbridge	62,400
The Use of Surface Polysaccharide Antigens as a Vaccine in Preventing Diarrhea Caused by Enteropathogenic <i>E. coli</i> (EEC) in Calves, Pigs and Lambs	S.D. Acres	Veterinary Infectious Disease Organization — Saskatoon and the University of Calgary — Calgary	138,000

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
Improvement of Feed Efficiency and Disease Resistance of Newborn Calves and Lambs by the Early Introduction of Beneficial Digestive Tract Bacteria	K.-J. Cheng J.W. Costerton	Agriculture Canada — Lethbridge and the University of Calgary — Calgary	84,000
Immunological Control of Shipping Fever	P.H.G. Stockdale	Western College of Veterinary Medicine — Saskatoon	60,000
The Study of (Bovine) Viral Diarrhea-Mucosal Disease (BVD-MD) and Malignant Catarrhal Fever (MCF) Viruses in Order to Develop More Efficient Diagnostic Tests to Detect Infections in Domestic and Wild Animals	T. Yamamoto	University of Alberta — Edmonton	93,000
Determination of Efficacy of Methods Used to Fertility Test Beef Bulls for Multiple-Sire Breeding under Range Conditions	G.H. Coulter	Western College of Veterinary Medicine — Saskatoon and Agriculture Canada — Lethbridge	147,800
Further Evaluation of Trace Mineral Status in Alberta Feedstuffs in Relation to Animal Nutrition	P.J. Martin	Norwest Feed Research Ltd. — Edmonton	25,000
High Moisture Barley for Feedlot Cattle	J.J. Kennelly	University of Alberta — Edmonton	105,000
Virulence Mechanisms of <i>Haemophilus somnus</i> Bacteria Relative to the Carrier Status and the Immune Response of Infected Feedlot Cattle	J.R. Saunders	Western College of Veterinary Medicine — Saskatoon	60,000
Bovine Respiratory Disease in Alberta Feedlots	T.L. Church	Alberta Agriculture — Edmonton and the Veterinary Infectious Disease Organization — Saskatoon	279,000
Production of Pregnancies Following the Storage of Bovine Embryos in Liquid Nitrogen	B.F. Shea	Alberta Livestock Transplants Ltd. — Calgary	35,000
Effects of Cold Environments on Digestion and Feed Intake of Ruminants	R.J. Christopherson	University of Alberta — Edmonton	84,000
Factors Influencing Natural Service Fertility of Beef Bulls in Pasture	M. Makarechian	University of Alberta — Edmonton	47,000
Agricultural Potential of Wild Ruminants	R.J. Hudson	University of Alberta — Edmonton	70,664
Ruminant Feed Evaluation Unit	L.P. Milligan	University of Alberta and Alberta Agriculture — Edmonton	190,000
Chemical and Physical Determinants of Forage Digestion and Intake	L.P. Milligan	University of Alberta and Alberta Agriculture — Edmonton	150,000
Quality of Barley for Feedlot Cattle	G.W. Mathison	University of Alberta — Edmonton	25,000
The Effect of Delayed Breeding of Dairy Cows on Milk Yield, Reproductive Efficiency and Economic Returns to Dairy Producers	J.J. Kennelly	University of Alberta, the University of British Columbia — Vancouver and Agriculture Canada — Agassiz	150,000

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
Control of Protein Deposition in Ruminant Muscle	J.R. Thompson	University of Alberta — Edmonton	73,000
Evaluation of the Efficiency of Weaned Calf Production in Beef Cattle	J.A. Newman	Agriculture Canada — Lacombe	47,000
The Effect of Ration, Implant and Rumensin on the Performance of Growing and Finishing Beef Steers	S.E. Beacom	Agriculture Canada — Melfort	40,000
Field Testing the University of Alberta Beef Synthetic Bulls	M. Makarechian	University of Alberta — Edmonton	72,000
Development and Testing of a Calf Scours Coronavirus Vaccine	S.D. Acres	Veterinary Infectious Disease Organization — Saskatoon	91,500
Management Strategies for Young Bulls	M.A. Price	University of Alberta — Edmonton	37,400
Morphological and Biochemical Studies of the Microbial Digestion of Treated and Supplemented Straw to Improve Its Nutrient Yield for Ruminants	J.W. Costerton K.-J. Cheng	University of Calgary — Calgary and Agriculture Canada — Lethbridge	27,000
Preparation of <i>Pasteurella haemolytica</i> Antigens for Use as a Vaccine against Shipping Fever	T.J.G. Raybould	Veterinary Infectious Disease Organization — Saskatoon	60,000
Winter Stress Components in the Alberta Cattle Industry	B.A. Young	University of Alberta — Edmonton	40,000
High Moisture Barley for Dairy Cows	J.J. Kennelly	University of Alberta — Edmonton	50,000
Mechanism Mediating Ruminal Stasis in Lactic Acidosis (Grain Overload)	E.C. Crichlow	Western College of Veterinary Medicine — Saskatoon	21,000
Evaluation of Crystalline Copper Carbonate as a Dietary Copper Supplement for Ruminants	W.T. Buckley	Agriculture Canada — Agassiz	9,000
Splitting of Bovine Embryos to Produce Identical Twin Calves	B.F. Shea	Alberta Livestock Transplants Ltd. — Calgary	35,000
Nutrient Manipulation to Modify Brain Function, Appetite and Feed Efficiency in Farm Animals	R.J. Christopherson	University of Alberta — Edmonton	29,000
Special Crops			
Regional Potato Testing	D.R. Lynch	Agriculture Canada — Lethbridge and the University of Alberta — Edmonton	276,520
Alternate Crop Varietal Development for High Oil and Protein Yields	H.H. Muendel	Agriculture Canada — Lethbridge	216,880
Studies of the Development, Spread and Control of Four Economically Important Diseases of Greenhouse Crops	R.J. Howard	Alberta Agriculture — Brooks	123,800
Effects of Various Soil-Active Herbicides on Succeeding Rotational Crops	R. Esau	Alberta Agriculture — Brooks	21,600
Establishment of Leaf Tissue Analysis Standards for Greenhouse Crops in Alberta	M.J. Rowell	Norwest Soil Research Ltd. — Edmonton	71,600

PROJECT TITLE	RESEARCH MANAGER	INSTITUTION/ LOCATION	TOTAL FUNDING 1979/84
The Impact of Cultural Practices on the Growth and Production of Tree Crops	R.H. Knowles	University of Alberta — Edmonton	50,645
Studies on the Biology and Control of Root Diseases on Pulse Crops	R.J. Howard	Alberta Agriculture — Brooks	58,000
A Study of the Variability in Hill-to-Hill Yields of Alberta Potatoes	W.T. Andrew	University of Alberta — Edmonton	82,500
The Maximum Possible Yields of Selected Vegetables under Controlled Environmental Conditions	E.W. Toop	University of Alberta — Edmonton	43,980
Pathogen-Free Seed Potatoes — To Ensure a Continuing Source of the Highest Quality of Seed Potatoes for Alberta Producers of Seed, Processing and Fresh Potatoes	S.H. De Boer	Agriculture Canada — Vancouver	76,000
Control of Root Rot on Pulse Crops in Southern Alberta	R.J. Howard	Alberta Agriculture — Brooks	142,000
Cultivar and Agronomic Studies of Special Crops in Alberta with Emphasis on the Central and Northern Areas	R.G. Gaudiel	Alberta Agriculture — Brooks	75,000
A Study of Southern Alberta Russet Burbank Potato Fields to Establish the Optimum Ratios between Essential Elements to Promote Maximum Quality Growth	P.D. Sandberg	Alberta Soil and Feed Analysis Ltd. — Lethbridge	5,000
Rapid Propagation of Saskatoon Plants <i>In vitro</i>	R.E. Harris	Applied Research and Development Consultant — Victoria	25,700
Evaluation and Development of Practical Diagnostic Procedures for Potato Spindle Tuber Viroid Disease in Alberta	C. Hiruki	University of Alberta — Edmonton	30,000
Frost Protection through Management of Ice Nucleating Bacteria	C.W. Gietz T. Kaneda	Alberta Agriculture and Alberta Research Council — Edmonton	20,400
Bacterial Siderophores as Plant Growth Stimulating Factors: Mobilization of Metals and Competition with Phytopathogenic Bacteria	W.J. Page	University of Alberta — Edmonton	18,000
Field Production of Ornamental Plants (Dried) for the Flower Culture Industry	B.J. Godwin	Olds College — Olds	20,000

ON-FARM DEMONSTRATION PROGRAM PROJECT SUMMARIES

FIRST MANDATE

PROJECT TITLE AND OBJECTIVE	PRINCIPAL CO-OPERATOR	LOCATION	FUNDING AWARDED*	
			1982/83	1983/84
Region I (Southern)				
Zero Tillage vs. Minimum Till Trial • to provide a farm-scale comparison of zero tillage and minimum tillage using conventional farm equipment	B.J. Knott	Stavely	2,450	2,628
Wheat and Barley Varietal Trials (Stubble) • to perform a three-year trial on five spring wheat and durum varieties and six barley varieties on stubble land	Ron Smith	Nanton	200	210
Wheat and Barley Varietal Trials on Summerfallow • to conduct a varietal trial on five spring and durum wheat varieties and six barley varieties on fallow land	Marvin Vandervalk	Claresholm	own expense	own expense
*On-Farm Demonstration Program projects are approved year-round; therefore, the 1984/85 projects will be reported in the 1985 Progress Report for Farming for the Future.				

PROJECT TITLE AND OBJECTIVE	PRINCIPAL CO-OPERATOR	LOCATION	FUNDING AWARDED	
			1982/83	1983/84
Evaluation of the Warm Treatment of Swine Manure • to evaluate the reliability and operational ease of a combined solid-liquids separator/warm treatment process under Alberta conditions	Al Coutts	Bow Island	8,700	in progress
Blackbird Control • to attempt to control blackbirds through the use of bird scaring devices	Tom Droog	Bow Island	2,045	complete
Savory Grazing Method • to determine the effectiveness of the Savory Grazing Method under commercial ranch conditions in Alberta	Blake and Mary Holtman	Taber/Fort Macleod	7,523	15,623
Fertilizer Application Trials • to demonstrate the use of various types of fertilizer applicators on wheat in spring and fall	Casey Douglass	Vulcan		1,746
Proper Inoculation of Pulse Crops • to adapt innovative inoculation procedures to farm-scale operations	Pulse Growers Association of Alberta	Lethbridge area	12,750	8,100
Alfalfa in Controlling Saline Seeps • to measure the effectiveness of alfalfa in reducing saline seeps, and to compare a tap root alfalfa with a fibrous root alfalfa in that role	William Norris	Warner		4,374
Wind Power for Pumping Water • to design simple, reliable low-cost windpowered equipment for pumping water	Norman Ward	Granum		1,147
Demonstration of Cereal Grasses as Irrigated Pastures • to demonstrate that irrigated cereals can replace or complement perennial pastures for livestock grazing	Jerry Reti	Taber		1,835
Phosphate Fertilizer on Alfalfa • to provide a farm-scale comparison of phosphate fertilizer application to a pure stand of Angus alfalfa	Dan Loewen	Rosemary		512
Crop Fallow and Continuous Cropping Using Zero and Conventional Tillage • to provide a farm-scale comparison of zero tillage vs conventional tillage in continuous-cropped and crop-fallow wheat	Wayne Arrison and D.R. Kelly	Bassano		2,241
Handling of Corn Stover • to determine the quality and storability of corn stover as cattle feed and to assess different processing methods	R.L. Laidlaw	Bow Island		3,328
Fertility Trial on Continuous Cropped Durum Wheat • to evaluate the effects of various fertilizer treatments on the yield of continuous cropped dryland wheat	Albert Zoeteman	Fort Macleod		260
Fertility Trial on Continuous Cropped Barley • to evaluate the effects of various fertilizer treatments on the yield of continuous cropped dryland barley	Bob Reach	Fort Macleod		260
		TOTAL REGION I	\$33,668	\$42,264
Region II (South Central)				
Effect of Trace Mineral Supplementation on Calf Gains and Cow Breeding Performance • to establish if there is a need to feed trace minerals to cows on native pastures	Dave Lathwell	Sundre	1,350	complete
Effect of Trace Mineral Supplementation on Calf Gains and Cow Breeding Performance • to establish if there is a need to feed trace minerals to cows on native pastures	J.C. Hughes	Longview	1,350	complete

PROJECT TITLE AND OBJECTIVE	PRINCIPAL CO-OPERATOR	LOCATION	FUNDING AWARDED	
			1982/83	1983/84
Preimmunization of Feeder Cattle • to demonstrate the value of preimmunizing calves before selling them	D.J. Edge	Airdrie	550	in progress
(A) Comparison of Weight Gains of Suckling Calves Implanted and Not Implanted with Ralgro and (B) Comparison of Weight Gains and Health Status of Weaned Calves in a Feedlot, Implanted Once and Twice with Growth Implants • to assess the value of using growth implants on suckling and weaned calves	John Negropontes	Sundre	1,000	in progress
Special Crops Demonstration Trial • to evaluate the potential for growing several species of special crops in the demonstration areas	Chinook Applied Research Association	Hanna/Coronation	6,950	9,209
Snow Entrapment • to measure the benefit of using double diverging deflectors on a swather for increasing snow entrapment and, consequently, soil moisture	Don Pryor	Three Hills	750	540
Fertilizer Rejuvenation of an Aged Perennial Forage Stand • to illustrate the use of fall and spring broadcast fertilizer to prolong the useful life of a brome-alfalfa stand	Russel Mayberry	Hanna	1,050	in progress
Foxtail Barley Control • to increase awareness of the effectiveness of various chemicals in controlling foxtail barley	Willard Koch	Three Hills	250	in progress
Organic Matter Building • to promote the use of sweet clover underseeding and plowdown to replace summerfallow	S.F. Davidson	Morrin	350	1,400
Evaluation of Moisture Conservation by Various Stubble Heights • to evaluate the ability of stubble cut to various heights to trap greater amounts of snow for soil moisture conservation	Chinook Applied Research Association	Oyen	745	1,290
Evaluation of Moisture Conservation of Continuous Cropping vs. Summerfallow Rotation • to assess the moisture levels and crop yields of continuous cropping and summerfallow systems	Chinook Applied Research Association	Youngstown	905	2,285
Evaluation of Moisture Conservation by Shelter Belts • to demonstrate and evaluate the potential of increased snow trap and therefore improved moisture conservation by using shelter belts	Chinook Applied Research Association	Altario		705
Nitrogen and Organic Matter Building • to promote the use of alfalfa underseeding as a replacement for summerfallow	Neil Cameron	Huxley	75	450
Pasture Sage Control • to demonstrate the chemical control of pasture sage	Chinook Applied Research Association	Hanna		761
Alberta Certified Preconditioned Feeder Program: Calf Performance Trial • to demonstrate the value of preconditioned calves in terms of their economic value, feedlot performance, etc.	Donald Petersen	Sundre		640
Evaluation of Spring Seeded Norstar Winter Wheat as Summer Pasture • to evaluate spring seeded winter wheat as summer pasture, and to compare it with other pastures with respect to carrying capacity, durability, digestibility and economics	Peter Hok	Cereal		2,047

PROJECT TITLE AND OBJECTIVE	PRINCIPAL CO-OPERATOR	LOCATION	FUNDING AWARDED	
			1982/83	1983/84
Solar Battery Charger Evaluation • to evaluate a solar collector used in maintaining the charge on electric fence batteries	C.W. Rosenau	Youngstown		1,000
Grazing Annual Forages, Winter Wheat and Triticale • to determine maximum production and grazing potential of spring seeded winter wheat and triticale for the foothills	Alastair Robertson	Longview		1,500
Beef Breeding Management by Heat Synchronization • to evaluate heat synchronization as a tool to shorten breeding season, develop a more uniform calf crop and shorten calving season	Pat Harvie	Priddis		3,100
Summerfallow Tillage Reduction with Herbicides • to demonstrate the use of herbicides to reduce the number of tillage operations on summerfallow for soil conservation	Mervin Tetz	Three Hills		800
Sweet Clover Incorporation Demonstration Trial • to compare the abilities of a Soil Master cultivator and a discer to incorporate a tall stand of sweet clover on cropland for soil conservation	N.R. Storch	Hanna		1,110
		TOTAL REGION II	\$15,325	\$26,837
Region III (North Central)				
Pasture Improvement Demonstration • to demonstrate that good forage management, use of adapted species and rotational grazing can increase livestock production on what is often considered wasteland	Geoff and David Hoar	Innisfail	5,300	in progress
Ralgro Implant Trial with Bulls • to evaluate the effect of Ralgro implants on the growth, sexual development, feedlot management and carcass characteristics of bull calves	Ty Lund	Alhambra	525	3,275
Central Alberta High Moisture Barley Study • to collect time-series data on high moisture barley yields, quality, harvest dates, feeding results, etc.	Melvin Stickland	Red Deer	5,500	in progress
Effect of Bovaid and Growth Implants in Yearling Steers and Nursing Bull Calves • to determine the effects of using implants and fly control tags on weight gains of yearlings and calves	D.G. Carlyle	Blackfalds	8,102	complete
Effect of Growth Implants on the Growth and Sexual Development of Bull, Steer and Heifer Calves • to determine the effects of Ralgro on bull calf growth, of early or late castration in combination with use of Ralgro on steer calves, and of implants on the growth and sexual development of heifers	Stan and Ron Marcinek	Condor	2,688	complete
Effect of Trace Minerals on the Growth of Suckling Calves and the Response to Ralgro Implants in Bull Calves • to determine the effect of a combination of feeding trace minerals and using Ralgro on the growth of suckling beef calves and to evaluate the effect of Ralgro on the growth and sexual development of bull calves	Gordon Young	Leslieville	1,469	in progress
Swath Turner • to build prototype equipment for turning swath to increase the drying rate of forage	A.J. Murdoch	Eckville	2,100	in progress
Free Stall Dairy Barn • to compare conventional stalls and stalls with brisket boards with regard to cleanliness, cow comfort, bedding required and cow preference	Case Korver	Rocky Mountain House	1,465	in progress

PROJECT TITLE AND OBJECTIVE	PRINCIPAL CO-OPERATOR	LOCATION	FUNDING AWARDED	
			1982/83	1983/84
Soil Moisture Conservation • to use stubble barriers to increase snow entrapment and thereby increase soil moisture	R.A. Sommerville	Endiang		250
Soil Moisture Conservation Practice • to increase snow entrapment by creating stubble barriers	Lindsay Penosky	Botha	250	in progress
Liming and Ripping Acid Solonetzic Soil • to demonstrate the benefits of liming acid soils and of ripping solonetzic soils to increase the productivity of alfalfa and barley crops	G.D. Hughes	Wetaskiwin	2,387	in progress
Waterproof Bin Skirts • to design and construct a mold which can be used to produce fiberglass bin skirts for moisture proofing steel bin floors	Warren Henderson	Forestburg	700	in progress
Solonetzic Soil Improvement • to improve solonetzic soil productivity by deep tillage and lime applications	Ralph Klassen	Stettler	7,000	in progress
Heat Exchanger • to build and test a heat exchanger that can be used on an existing exhaust fan	Albert Stolte	Rocky Mountain House		1,040
Automatic Air Inlet Control — Dairy Barn • to adapt commercial ventilation equipment to achieve automatic control of inlet air and temperature	Greg Harink	Lacombe		1,200
Beef Pasture Demonstration Project • to compare a high production grazing system for beef cattle with grain production to determine which gives higher net return per acre	L.A. Steeves	Meeting Creek		4,696
Vicogen Trial • to demonstrate the effectiveness of Vicogen vaccine in preventing calf scours	Ron and Stan Marcinek	Condor		1,205
Buck Lake Fencing Rotational Grazing Experiment • to increase beef production by improving grass sward, lengthening grazing season and experimenting with fencing design	Jerry Holtman	Buck Lake		2,655
Tempered Grain for Feedlot Cattle • to determine the effect of tempering grain with water on growth rate and feed efficiency of feedlot cattle	Murray Stauffer	Eckville		6,375
Ralgro at Birth and Bovaid on Calves • to determine benefits of implanting calves at birth and at branding, to determine effects of Bovaid ear tags, and to assess interaction between Bovaid and Ralgro	Gordon Young	Leslieville		1,708
Ralgro Implant Trial with Bulls • to evaluate Ralgro implanted in bull calves from birth to slaughter	Ty Lund	Alhambra		525
Bovaid and DeBantic Insecticide Ear Tags on Cow-Calf Operations • to evaluate the effectiveness of two types of insecticide ear tags	Arthur Ziegler	Stettler		3,978
Ammoniation of Large Round Hay Bales • to determine if ammoniation is a practical way to preserve hay in large round bales at high moisture content	R.D. Munro	Innisfail		907
Canola Underseeded to Winter Wheat as Fall Pasture • to examine the feasibility of using canola underseeded to winter wheat as fall pasture	Rudy Gerber	Kelsey		2,245
Evaluation of Implant Programs and Bovaid on Calves to Yearlings • to demonstrate the most effective implant program, especially in relation to castration date, reaction to stress and use of Bovaid ear tags	Stan and Ron Marcinek	Condor		1,437

PROJECT TITLE AND OBJECTIVE	PRINCIPAL CO-OPERATOR	LOCATION	FUNDING AWARDED	
			1982/83	1983/84
Portable Lambing Facility • to develop a portable lambing structure to improve care of newly lambled ewes	Ian and Deb Clark	Bentley		2,100
		TOTAL REGION III	\$37,486	\$33,596
Region IV (Northeast)				
Evaluation of Cultural Practices Used to Extend the Growing Season, Increase Production and Improve Quality of Vegetables • to extend the growing season and to increase production and quality of fruits and vegetables through the use of innovative cultural techniques	Robert and Bernice Grey	Fort McMurray	5,250	3,350
Comparison of Smooth Wire Suspension Fencing with Standard Barbed Wire Fencing • to compare five-strand smooth wire suspension fencing to standard four-strand barbed wire fencing	D.S. Millar	St. Paul	3,200	complete
Zero (Minimum) Till Demonstration • to study the feasibility of zero and minimum tillage in the Wainwright area	Keith Brower	Wainwright	6,632	in progress
Cultivated Blueberry Crop Trial • to assess which blueberry varieties and cultural practices are most productive in the Bonnyville area	Ed and Eleanor Reddecliff	Bonnyville	3,500	in progress
Application of Passive Solar Collectors to Slant Wall Farm Shops • to create an inexpensive method of controlling the temperature in a farm shop	Kirk Harrold	Lamont	2,760	in progress
Pasture Demonstration Project • to extend the grazing season and to increase beef production through use of recommended pasture species, fertilizer rates and rotational grazing fencing methods	Gary Mouille	Lac La Biche	5,335	in progress
Comparisons of Various Varieties of Cereal Grains for Silage • to compare various cereal varieties for silage, to relate cutting stage to nutritional yield, and to establish economic benefits of these crops	Ernest and D.E. Livingstone	Vermilion		7,700
Grazing Demonstration • to extend the grazing season, increase production through proper grazing management, and to test high tensile wire for cross fencing	Philip Menard	Plamondon		4,787
Beef Cow-Calf Rotational Grazing Demonstration • to demonstrate a rotational grazing system using new varieties, chemical fertilization and proper grazing management	Gordon Ceretzke	Andrew		4,895
Grass Species Trial • to determine the suitability of Meadow Foxtail and Meadow Bromegrass in the Wainwright area	Ronald Mansfield	Wainwright		1,750
Round Bale Silage • to use individual bagging to maintain nutritive value of spring rye feed; to compare its quality with greenfeed	Douglas Bullock	Metiskow		1,334
Feasibility of Wild Rice Production in Northeastern Alberta • to determine the feasibility of wild rice production in a number of lakes north of Lac La Biche	Thomas Lambert, Northern Alberta Wild Rice Growers Association	Wandering River		3,000
Effect of the Metadata Blowaway System on Piglet Mortality Due to Crushing • to determine if a new farrowing crate attachment is useful under Alberta conditions	R.C. Scoffom	Vilna		900

PROJECT TITLE AND OBJECTIVE	PRINCIPAL CO-OPERATOR	LOCATION	FUNDING AWARDED	
			1982/83	1983/84
Rotational Grazing Project • to demonstrate the benefits of rotational grazing through use of fertilizers and new grass varieties	V.L. Hanson	Viking		2,440
		TOTAL REGION IV	\$26,667	\$30,156
Region V (Northwest)				
Grain Feeding Yearlings on Pasture • to evaluate limit feeding and grain feeding pasture yearlings and to assess problems associated with the physical layout of rotational grazing pastures	Keith English	Dapp	5,623	complete
Late Summer Pasture and Grain versus Feedlot for Finishing Yearling Heifers • to determine a least-cost method of maximizing weight gain by comparing supplemental feeding in late summer with placing cattle directly into a feedlot	K.M. Holt	Sangudo	2,880	complete
Solar Heated Air for Grain Drying and Aeration and Building Space Heating • to enable early harvest through provision of cheap, efficient grain drying and to reduce energy costs by using a solar heating mechanism for space heating	Schwanke Farms Ltd.	Sangudo	5,000	in progress
Dairy Pasture Demonstration Project • to demonstrate a high production rotational grazing system for dairy cattle through the use of recommended legume and grass species, fertilization, grazing and rest periods, and stocking rates	Ernie Siemens	Rochester	5,854	3,800
Two Four-Wheel Drive Tractors Hooked in Tandem, Using One Operator • to create a method for one person to hook two tractors in tandem for the purpose of pulling extra-long farm implements	Jerry Bauer	Thorhild	2,950	complete
Chaff Evaluation, Athabasca District • to evaluate chaff quality from various cereal crops and to assess cow performance when fed chaff as part of a balanced feed ration	David Bencharsky	Boyle	5,450	complete
Greenhouse and Dairy Barn Project • to use waste heat from a dairy barn for supplemental heat in a small commercial greenhouse	Dick DeKlerk and Frank Blenke	Leduc		3,000
Grain Feeding Yearlings in Late Season on Rotational Grazed Pasture • to evaluate limit feeding and supplementary grain feeding of pastured yearlings in late season	Keith English	Dapp		4,529
Maximizing Returns Through Beef Cattle Utilizing Annual Pastures and Rotational Grazing • to demonstrate the economic benefits of rotational grazing beef cattle on annual pastures	Ray Olesky	Sangudo		6,545
Development and Evaluation of Grazing Management Strategies on Rotationally and Intensively Grazed Pastures • to evaluate the effect of timing of first grazing on subsequent pasture quality; to evaluate grazing management and nutritional differences between species; and to determine proper grazing stress for highest gains per acre	Pembina Forage Association	Westlock		6,200
Pasture Establishment and Rotational Grazing on Heavy Clay Soil • to demonstrate an efficient grazing management program using proper forages and a rotational grazing system	West Central Forage Association	Wildwood		16,015

PROJECT TITLE AND OBJECTIVE	PRINCIPAL CO-OPERATOR	LOCATION	FUNDING AWARDED	
			1982/83	1983/84
Late Summer Pasture and Grain vs. Feedlot for Finishing Yearling Heifers • to determine whether pasture plus supplemental grain is cheaper than feedlot feeding to finish yearling heifers	K.M. Holt	Sangudo		2,880
Round Bale Silage: An Alternative to Hay • to compare round bale silage to red clover hay, to explore methods of storing round bale silage, and to test different balers	Ray Fausak	Evansburg		2,522
Restructuring of Peat Soils • to improve the texture of peat soil by mixing the upper peat layer with the lower clay loam layer, and to assess the effect of improved texture on soil productivity	R.E. Smith	Fawcett		1,679
Canola Meal for Dairy Cattle • to demonstrate the value of canola meal as a protein supplement for lactating dairy cattle	Anthony Stadnyk	Westlock		4,598
Recycling Dairy Cattle Wastes • to measure the benefits of including recycled dairy cattle wastes in feeder cattle rations in terms of costs, daily intake and daily weight gain	G.D. Fraser	Westlock		4,425
Intensive Cereal Management Techniques Applied to Barley Production in Parkland Alberta • to combine three techniques of intensive cereal management and to assess their effects on yield, economic returns, lodging, disease, etc.	Ken Nelson	Westlock		6,950
		TOTAL REGION V	\$27,757	\$63,143
Region VI (Peace River)				
Raised Lambing Crates • to demonstrate health and other benefits of confining pregnant ewes to raised crates for two or more days before delivery	L.T. Jones	Fairview	3,822	in progress
Zero Till Drill • to investigate the economics and productivity arising from use of a zero till drill in the Peace River area	Mike Gach	Nampa	11,000	in progress
Automatic Depth Control for Farm Implements • to develop a depth control for use on a wing-type cultivator	Dan Ropchan	Grimshaw	1,950	in progress
Hog Barn Heat Exchanger • to construct and test a prototype of a simple, functional heat exchanger	Steve Pain	Nampa	2,770	complete
Wood Heated Hot-Water-to-Hot-Air Heating System • to evaluate a wood heating system designed to heat a farm residence and shop	Brian Leitch	Grimshaw	5,500	in progress
Second Year No-Till Companion Crop in Establishing Forage Seed Crops • to grow a no-till crop from land underseeded the previous year to a forage seed crop	W.P. Harris	Beaverlodge		3,800
Comparative Fertilizer Trials • to obtain yield data comparing deep banded urea, anhydrous application and broadcast application	Alex Tinevez Robin Hopkins	Peace River		4,200
Increased Honey Production through Continuous Rapeseed Bloom • to increase honey production by extending the honey-flow period through early and late seedings of rapeseed	John Woodburn	Grimshaw		7,670

PROJECT TITLE AND OBJECTIVE	PRINCIPAL CO-OPERATOR	LOCATION	FUNDING AWARDED	
			1982/83	1983/84
Assessing the Value of Propane Guns in Protecting Spring Bee Yards from Bear Damage • to evaluate the effectiveness of propane guns in preventing bear damage to hives in spring bee yards	Jean and Gerard Paradis	Girouxville/Guy		1,660
Echo Ranch Pasture Project • to demonstrate effective pasture establishment in the Peace River area, using rotational grazing and optimal soil fertilization	D.J. Stickney	Manning		14,083
Reclamation Study • to improve soil productivity by increasing soil pH, improving tilth, reducing salinity and improving structure	Harry Rowney	Sexsmith		6,345
Queen Rearing and Overwintering • to foster honeybee stock self-sufficiency through overwintering, queen rearing techniques and testing Alberta-bred bees	Jerry Awram Dennis McKenna	Hines Creek/Fairview		11,935
Effect of Shelter Size on Alfalfa Pollination with Leafcutting Bees • to determine how many acres of alfalfa a single shelter of leaf-cutting bees can pollinate	Robert Gartly	Eaglesham/Rycroft/ Sunny Valley/ Three Creeks		24,920
		TOTAL REGION VI	\$25,042	\$74,613

GRADUATE STUDENT RESEARCH SUPPORT PROGRAM PROJECT SUMMARIES FIRST MANDATE

PROJECT TITLE	STUDENT	DEPARTMENT	FUNDING AWARDED	
			1982/83	1983/84
University of Alberta				
Design and Control of Air Inlets for Ventilation of Animal Housing	J.J. Leonard	Agricultural Engineering	9,300	in progress
Comparison of Evaluation Techniques Used in Meat Research	P.J. Shand	Foods and Nutrition	1,900	in progress
Effect of Live Weight and Fat Loss on Sow Performance and Productivity	E.M. Weltzien	Animal Science	6,000	complete
Effect of Diet and Cooking Method on the Quality Attributes and Chemical Composition of Beef from Bulls	M.E. McKinley	Foods and Nutrition	3,000	in progress
Energy Expenditure on Ion Transport in Intestinal Epithelium and Liver in Sheep and Cattle	B.B. McBride	Animal Science	10,000	complete
Fat Mobilization in Dairy Cows in Early Lactation	E.M. Sexton	Animal Science	10,000	in progress
Bioenergetics of Wapiti	W.G. Watkins	Animal Science	8,400	in progress
Margin Analysis and Trends in Consumer Demand for Red Meats and Poultry	J.R. MacArthur	Rural Economy	5,500	in progress
Cytological and Biochemical Characterization of the Potential B Genome Donors of Common Wheat, <i>Triticum aestivum</i>	K.B. Kerby	Genetics	5,000	in progress
Implications to Alberta of Remaining Independent or Participating in the National Chicken Marketing Plan	Meghann Douglas	Rural Economy	3,550	complete

PROJECT TITLE	STUDENT	DEPARTMENT	FUNDING AWARDED	
			1982/83	1983/84
Patterns of Fat Deposition in Mice Selected for High Six Week Body Weight	R.K. Salmon	Animal Science	6,000	in progress
Development of Chemical Methods for Predicting Protein Quality (Degradability) in Dairy Cow Rations	B.K. Kirkpatrick	Animal Science	10,000	in progress
The Effect of Forage Crops on Luvisolic Soils	Klaas Broersma	Soil Science	5,000*	in progress
Study of Pretest and On-Test Performance of R.O.P. Tested Boars	B.B. Allan	Animal Science	5,000	in progress
Cross-Fostering as a Measure of Direct and Indirect Genetic Effects in Selected Lines of Mice	D.R.C. Bailey	Animal Science	6,000	in progress
Effects of Boar Exposure on Puberty Induction of the Young Gilt	F.D. Evans	Animal Science	7,900	complete
Refinement of Sensing Systems for Agricultural Machinery Applications	M.T. Marple	Agricultural Engineering		8,774
Effect of Soil Physical/Chemical Conditions on Yield and Protein in No-Till Grain	J.M. Carefoot	Soil Science		6,500
Investigation of the Chloroplast Protein Implicated in the Mode of Action of Triazine Herbicides	P.S. Summers	Plant Science		5,500
Effects of Early Weaning on Cow Herd Maintenance Costs and Producer Income	F.S. Novak	Rural Economy		2,000
Analysis of Flavor Enhancers and Their Breakdown Products in Food	Thanh Nguyen	Food Science		8,000
Heat and Mass Transfer in the Cooling (Freezing) of Foodstuffs with Aqueous Freezant	C.J. Toupin	Food Science		6,000
Pneumatic Transportation of Granular Materials	K.A. Roberston	Agricultural Engineering		5,750
A Study of Fat Mobilization in the Lactating Sow	E.S. Lythgoe	Animal Science		3,000
Determination of Protein Digestibility in Feedstuffs for Pigs	D.M. Conway	Animal Science		4,000
Mode of Action of Chlorsulfuron (GLEAN) and its Analogs	H.D. Bestman	Plant Science		7,600
Translocation, Metabolism and Mode of Action of 3,6-Dichloropicolinic Acid (LONTREL)	J.C. Hall	Plant Science		6,000
Phenolics in Potatoes: Possibility for a Chemical Prediction of Tuber Resistance to Infectious Diseases	R.A. Currie	Food Science		9,000
Studies to Improve Yield, Quality and Consumer Acceptance of Commerical Quarg in Alberta	T.S. Sohal	Food Science		2,200
Response of Muscle to Loading in Sheep	J.L. Aalhus	Animal Science		6,500
The Use of Modified Nylon Bag Technique for Measuring the Digestibilities of Energy and Protein in Feedstuffs for Horses	L.K. Todd	Animal Science		5,000
<i>In Vitro</i> Polypeptide Synthesis of mRNA Isolated from Leaves of Gateway Barley and Its Virescens Mutant	E.A. Weretilnyk	Plant Science		4,500
An Investigation into the Status of Water in Meat	R.W. Currie	Food Science		7,000
		TOTAL	\$102,550	\$97,324

*Funds for this project were approved in the 1982/83 fiscal year but were not released until the 1983/84 fiscal year.

PROJECT TITLE	STUDENT	DEPARTMENT	FUNDING AWARDED	
			1982/83	1983/84
Western College of Veterinary Medicine				
Pathogenesis of Nervous Signs Associated with Bovine Enteric Coccidiosis	C.M. Isler	Veterinary Pathology	9,900	in progress
Isolation and Characterization of Infectious Bovine Rhinotracheitis Virus (IBRV)-Specific Glycoproteins and Their Relationship to Immune Recognition	Sylvia van den Hurk-van Drunen Littel	Veterinary Microbiology	9,900	in progress
Environmental Factors and Enzootic Pneumonia in Saskatchewan Swine Barns	S.W. Bauck	Herd Medicine and Theriogenology		9,500
		TOTAL	\$19,800	\$9,500
University of Calgary				
Urease Localization in Rumen Bacteria	R.J.C. McLean	Biology		6,800
		TOTAL		\$6,800
Total Funding Allocated through the Graduate Student Research Support Program			\$122,350	\$113,624

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION/ LOCATION	FUNDING 1984/85
Cereals and Oilseeds			
Development of Management Practices to Improve Cereal and Oilseed Productivity in the Peace River Region to develop management practices that will improve canola and cereal productivity and quality in the Peace River region	R.I. Wolfe	Agriculture Canada — Beaverlodge	91,050
The Effects of Low Temperatures and Diurnal Fluctuations on the Germination and Emergence of Canola to define the germination and emergence response of canola to low temperatures and daily temperature changes	P.F. Mills	Agriculture Canada — Beaverlodge	31,906
Acceleration of Canola Variety Development for the Peace River and Southern Alberta Regions to develop and evaluate superior, regionally adapted, high yielding, disease resistant, high nectar producing canola varieties for northern and southern Alberta	R.K. Downey R.S. Sadasivaiah D. Wilson	Agriculture Canada — Saskatoon, Beaverlodge and Lethbridge	375,000
Physiological Screening for Cold Hardiness in Winter Wheat and Triticale Germplasm to screen a wide range of winter wheat and winter triticale germplasm for cold hardiness and select new gene combinations from wide crosses which can be incorporated into commercial varieties suitable for central Alberta conditions	F.M. Mederick	Alberta Agriculture — Lacombe	14,500
Identification of Low Temperature Tolerant and Early Flowering Canola Genotypes to develop varieties of canola for central and northern Alberta which will establish a uniform, early stand and mature early	Z.P. Kondra	University of Alberta — Edmonton	24,400
Breeding Soft White Spring Wheats for Western Canada to develop a soft white spring wheat with improved leaf disease (stripe rust) resistance and sprouting resistance	J.B. Thomas	Agriculture Canada — Lethbridge	61,500
Screening Winter Wheat for Resistance to Snow Mold Pathogens under Controlled Conditions to assess snow mold damage and to determine the relative importance and distribution of snow mold pathogens in fall sown cereals and grasses in Alberta	D.A. Gaudet	Agriculture Canada — Lethbridge	26,500
Crop Protection and Entomology			
New Sensitive Assays Utilizing Specific Monoclonal Antibodies for Testing Potato Virus and Bacterial Diseases to produce monoclonal antibodies specific to ring rot bacterium and potato viruses and to devise monoclonal antibody 'cocktails' whereby the presence of a whole range of potato viruses and bacteria can be analyzed in one or two tests	S.H. De Boer	Agriculture Canada — Vancouver	36,000
Potassium Chloride as a Means of Reducing Root Rot in Barley to evaluate the potential benefits of applying relatively inexpensive chloride to help reduce barley yield losses resulting from root disease infestations	J.T. Harapiak	Western Co-operative Fertilizers Ltd. — Calgary	16,680
Feasibility Study for Control of Root Maggots (<i>Delia</i> spp.) on Canola to provide information for devising a pest management strategy against root maggots in canola crops	G.E. Ball	University of Alberta — Edmonton	38,742

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION/ LOCATION	FUNDING 1984/85
Seedling Blight of Canola in Alberta to identify and develop methods of storage for the pathogens of canola seedling blight	J.P. Tewari	University of Alberta — Edmonton	31,000
A Long-Term Study of the Influence of Environmental Variables on Herbicide Efficacy to examine herbicide efficacy and monitor environmental parameters to better define effects that environmental variables exert on herbicide performance in Alberta	W.H. Vanden Born	University of Alberta — Edmonton	15,800
Life History and Phenology of the European Corn Borer in Southern Alberta to collect information about the characteristics of the European Corn Borer in order to implement long-term, cost-effective pest management strategies	J.R. Spence	University of Alberta — Edmonton	23,334
Development of a Monitoring Program for Control of the Sugarbeet Root Maggot in Sugarbeets to implement a field monitoring/prediction program for sugarbeet root maggots, to establish an application time of post-emergent insecticides for root maggot control and to determine the relationship between sugarbeet root maggot population density sampled in the field and sugarbeet yield at harvest	G.H. Whitfield P. Bergen	Agriculture Canada — Lethbridge and Alberta Sugar Company — Taber	20,660
Identification of Irrigation Practices that Reduce Black Point in Soft White Wheat to determine the effects of irrigation practices and weather on the incidence and severity of black point in commercial soft white spring wheat fields in Alberta	R.L. Conner	Agriculture Canada — Lethbridge	14,740
Weed Control in Alfalfa for Seed Production to find chemical treatments that will control Canada thistle, sow thistle and quack grass without damaging alfalfa	J.R. Moyer	Agriculture Canada — Lethbridge	32,228
Use of Ethylene for Control of Germination of Dormant Weed Seeds in Alberta Soils to evaluate the use of ethylene and potassium nitrate to break the dormancy of weed seeds in order to reduce competitive abilities of weed seedlings	M.E. Spencer	University of Alberta — Edmonton	63,620
Effects of Chlorsulfuron on Succeeding Rotational Crops to determine safe cropping intervals for alfalfa, lentils, potatoes, rapeseed and barley on three different soil series (one dryland and two irrigated) following an application of the pesticide called chlorsulfuron	R. Esau	Alberta Agriculture — Brooks	13,230
Forages			
Management Systems for Grass-Legume Forage Crops in the Peace River Region to evaluate a method of seeding grass-legume forage stands with respect to productivity, efficiency of utilization of inputs and practical crop management	N.A. Fairey	Agriculture Canada — Beaverlodge	36,560
Soil Implant Inoculants for Alfalfa to determine the effectiveness of soil implant inoculants under soil temperature and soil moisture stress conditions	W.A. Rice	Agriculture Canada — Beaverlodge	49,750
Maximization of <i>In vitro</i> Alfalfa Embryo Production to Develop Artificial Seed Systems to optimize somatic embryo production for the development of artificial alfalfa seeds	T.H.H. Chen	Alberta Research Council — Edmonton	15,800

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION/ LOCATION	FUNDING 1984/85
Improvement of Distribution of Digestible Dry Matter in Smooth and Meadow Bromegrass under Pasture Production to improve pasture utilization via altering dry matter distribution in smooth brome through the use of a plant growth regulator (mefluidide) and to determine the usefulness of smooth brome and meadow brome crosses in the development of pasture crosses	V.S. Baron	Agriculture Canada — Lacombe	37,190
The Effects of Storage and Processing on Vitamin E Levels in Forages to assess the vitamin E levels of forages from farms and ranches in central Alberta as related to time of cutting and to determine effects of field storage, exposure to air and temperature on vitamin E stability	P.J. Martin R. Westra	Norwest Feed Research Ltd. and Westra- Danen Assoc. Inc. — Edmonton	25,000
Annual Forage Crops (Southern Alberta) to find suitable annual forage crops and agronomic practices that will provide good quality, high yielding pastures in southern Alberta	R.G. Gaudiel	Alberta Agriculture — Brooks	68,500
Control of Field-Drying Hay to compare single stem drying rates and raked swath and windrow (conditioned and unconditioned) drying rates of commonly used hay species in Alberta and to assess the effect of swath (windrow) raking schedules on drying rates	L.P. Milligan	University of Alberta — Edmonton	30,000
Irrigation			
Subsurface Drainage Depth and Spacing Criteria for Medium-to-Fine-Textured Soils Within Irrigated Alberta to evaluate standard drainage formulae used to predict 'optimum' drain spacings for effective water table control and to determine what effect changes in drain depth have on practical soil reclamation	D.B. Harker T. Sommerfeldt	Alberta Agriculture and Agriculture Canada — Lethbridge	57,120
Evaluation of Low Volume Wind Turbines for Pumping Water to evaluate the potential for wind turbines to efficiently and economically pump water on drainage and irrigation projects in Alberta	B.A. Paterson	Alberta Agriculture — Lethbridge	30,000
Adaption of Downstream Control to a Vertically Hinged Automatic Check Structure to automate downstream control structures of small irrigation laterals adapting a vertically hinged check gate	K.R. Craig	Underwood McLellan Ltd. — Lethbridge	63,500
Development of Agricultural Subsurface Drainage Design Standards for Alberta to obtain drain tile depth and spacing standards for key Alberta soils through determination of the 'critical' water depth, recession rate and parameters needed to determine drain spacing	H.S. Vander Pluym	Alberta Agriculture — Lethbridge	58,700
Land Resources and Engineering			
Development of Fertilizer Recommendations for Irrigated Grains and Oilseed Crops in Alberta to develop and refine nitrogen and phosphorus response curves for irrigated soft white spring wheat, durum wheat, canola, flax, hard red spring wheat and barley	R.H. McKenzie J.B. Bole	Alberta Agriculture and Agriculture Canada — Lethbridge	44,200
Conservation Tillage Practices for Cereal and Oilseed Crops in the Lower Peace River Region to maintain or increase yields, conserve soil moisture and reduce production costs with conservation tillage practices on various soil types in the Peace River region	G.W. Clayton	Agriculture Canada — Ft. Vermilion	55,000
Quantification of Soil Erosion in East Central Alberta to determine the impact of soil erosion on soil productivity through quantifying the rate of erosion on selected areas in east central Alberta	R.W. Howitt	Alberta Research Council — Edmonton	23,550

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION/ LOCATION	FUNDING 1984/85
Increasing Efficiency of Soil and Fall-Applied Fertilizer Nitrogen under Various Tillage Systems to determine the magnitude of over-winter losses of mineral nitrogen from fall-applied nitrogen fertilizers and the relative efficiency of fall- versus spring-applied nitrogen	S.S. Malhi	Agriculture Canada — Lacombe	40,000
Feasibility of Zero Tillage in Central Alberta to establish the feasibility of zero tillage through an economic analysis of cost/return data for conventional, minimum and zero tillage systems	P.A. O'Sullivan	Agriculture Canada — Lacombe	60,000
A Study of Water Erosion in the Peace River Region to measure annual runoff, sediment yield, soil loss and erodibility under different management practices in the Peace River region	D.S. Chanasyk	University of Alberta — Edmonton	70,000
Economic Appraisal of On-Farm Drainage to develop an effective method of assessing the economic feasibility of alternative drainage designs in Alberta	L.P. Apedaile	University of Alberta — Edmonton	15,900
Improving the Efficiency of Soil Nitrogen and Fertilizer Nitrogen for Different Tillage-Straw Systems to determine the long-term nitrogen fertilizer needs for different methods of tillage (zero till versus conventional till) and straw handling systems (removal versus retention)	M. Nyborg	University of Alberta — Edmonton	65,000
Nutrient Supply and Budgets in Luvisolic Soils: Use of Manure and Role of Organisms to determine the impact of nitrogen added through N_2 fixation and nitrogen removed by denitrification and to evaluate a technique for measuring the availability of manure N in luvisolic soils	J.A. Robertson	University of Alberta — Edmonton	86,096
Validation of ASAE Timeliness Criteria on Machine Repair Cost Formulae for Canadian Conditions to review literature on estimating farm machinery repair costs to determine whether present ASAE standards for timeliness criteria and for estimating repair costs are satisfactory for prairie farmers	A.W. Anderson	University of Alberta — Edmonton	6,600
The Effects of Post-Harvest Cultivation Practices on Springtime Soil Moisture to quantify the effects of various routine cultivation practices on gain of soil moisture from snowmelt under dryland conditions in central Alberta	D.S. Chanasyk	University of Alberta — Edmonton	10,900
A Study of Heat and Moisture Load and Air Quality in Commercial Poultry Breeding Facilities to establish heat and moisture loads, air quality and atmospheric contaminants in commercial poultry breeding facilities in Alberta and to determine the influence of management and/or housing practices on the thermal characteristics and air quality of such facilities	J.B. McQuitty	University of Alberta — Edmonton	48,870
Increasing Fertilizer Nitrogen Efficiency through Fertigation to determine the efficiency of fertilizer nitrogen applied to irrigated crops in southern Alberta through irrigation systems (fertigation) at several stages of crop growth compared to fertilizer incorporated into the soil prior to seeding	J.B. Bole	Agriculture Canada — Lethbridge	26,100
Evaluation and Development of Furrow Openers for Seed and Fertilizer Placement under No-Till Conditions to evaluate drills and furrow opener configurations with emphasis on effective seed and fertilizer placement under no-till conditions	C.W. Lindwall	Agriculture Canada — Lethbridge	25,000
The Effects of Soil Buffering Capacity on Phosphorus Fertilizer Recommendations to calibrate optimum phosphorus levels for Alberta soils with a range of soil buffering capacities	J. Ashworth	Norwest Soil Research Ltd. — Edmonton	15,550

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION/ LOCATION	FUNDING 1984/85
An Investigation of Hydrogeological Processes Influencing Dryland Salinity to identify problem recharge areas for dryland salinity and to develop a quantitative understanding of the dynamics of water and salt movement in the Blackspring Ridge area in order to provide baseline information for future control measures	R. Stein	Alberta Research Council Edmonton	85,000
Non-Ruminants			
Development of a Serodiagnosis for Porcine Mycoplasmal Pneumonia to develop a diagnostic test for enzootic porcine pneumonia in order to identify infected animals	G.W. Stemke	University of Alberta — Edmonton	55,164
Nutritional and Biochemical Studies with Horses to examine long-term effects of overfeeding on bone development, exercise physiology and locomotion of growing horses between the ages of 6 and 24 months	N.F. Cymbaluk	Western College of Veterinary Medicine — Saskatoon	36,150
Prevention and Control of <i>Haemophilus pleuropneumoniae</i> in Swine to develop a safe and effective vaccine which prevents sudden death from <i>H. pleuropneumoniae</i> and reduces the proportion of pigs which become chronic shredders of the organism, and to evaluate Tialumin, a water-soluble antibiotic, for treatment of acutely sick pigs via their drinking water	P.J. Willson A.D. Osborne	Veterinary Infectious Disease Organization and Western College of Veterinary Medicine — Saskatoon	50,642
Cell Culture System for Production of a Vaccine for Hemorrhagic Enteritis in Turkeys and Splenomegaly in Chickens to use a cell culture system to produce HE vaccine for field testing turkeys and chickens	J. van den Hurk	Veterinary Infectious Disease Organization — Saskatoon	48,665
A Comparison of Fertility of Frozen Semen, Fresh Semen and Natural Service in Swine Herds to compare the farrowing rate and litter size of sows inseminated with frozen boar semen at various stages of estrus and to compare results when using frozen semen and liquid semen	E.G. Maynard	Alberta Agriculture — Edmonton	51,500
The Mobile Nylon Bag Technique for Determining the Nutritive Value in Feedstuffs for Pigs to develop the Mobile Nylon Bag Technique for accurate and rapid measurement of the digestibility of protein and energy and amino acid availabilities in feedstuffs that are used in pig production in Alberta	W.C. Sauer	University of Alberta — Edmonton	18,000
Blood Chemistry Behaviour of Chickens Exhibiting the Sudden Death Syndrome to determine differences in blood chemistry and body temperatures between sudden death syndrome (SDS) chickens and live control chickens, and to search for behavior patterns which can be used to identify SDS chickens	J.R. Hunt	Agriculture Canada — Agassiz	24,300
Processing, Transportation, Marketing and Socio-Economics			
Blending of Low Erucic Acid Rapeseed Oil for Utilization as a Dietary Fat to assess the metabolic changes in laboratory animals as a result of having canola oil in regular rations	M.T. Clandinin	University of Toronto — Toronto	58,930
The Impact of Trade Barriers on the Canadian Canola Crushing Industry to assess the economic impact of the Japanese edible oil tariff structure on the Alberta canola crushing industry	C.A. Carter	University of Manitoba — Winnipeg	18,500

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION/ LOCATION	FUNDING 1984/85
Quality Evaluation of Canola Oils and Canola Oil Products • to study the storage and heat stability of currently available antioxidant-treated canola oils and canola oil products using odor evaluation and chemical analyses	Z.J. Hawrysh	University of Alberta — Edmonton	39,875
An Analysis of the Farm Production Unit with Recommendations for Improving Net Farm Income • to describe the contribution of farm production unit members to the farm operation and to identify the direct and indirect benefits to net farm income that are the results of contributions of farm production units	N. Keating	University of Alberta — Edmonton	32,640
Implications of <i>Salmonella</i> Contamination of Poultry Meat for Poultry Producers • to study the hazard posed by <i>Salmonella</i> and to evaluate production and processing controls to reduce its presence in poultry meat	M.E. Stiles	University of Alberta — Edmonton	40,500
Effects of Efficient Procedures and New Technologies on Beef Quality • to evaluate the effects of procedures and technologies on the eating quality and processing characteristics of beef	Z.J. Hawrysh	University of Alberta — Edmonton	35,000
Effects of Electrical Stimulation on Calcium Activated Neutral Protease and Z-Disc Actin in Beef • to explore the effects of electrical stimulation on the Calcium Activated Neutral Protease in postmortem beef muscle in order to enhance beef quality	F.H. Wolfe	University of Alberta — Edmonton	67,400
Analysis of Terramycin (Oxytetracycline) in Honey • to establish a microbiological testing regime to prove the applicability of testing procedures for analyzing terramycin (a drug used to control bee diseases) in honey	P. Sporns L. Roth	University of Alberta and Alberta Agriculture — Edmonton	33,200
The Beef Price Cycle and Responses by Western Cow-Calf Producers to Changing Prices • to estimate short-run and long-run supply responses by cow-calf producers in western Canada to changing calf and feeder prices	J.D. Graham	University of British Columbia — Vancouver	12,984
Farm Management Field Laboratory (Phase 2) • to study on an ongoing basis the capital structure and earning performance of commercial farm operations	M.L. Lerohl	University of Alberta — Edmonton	59,190
Engineering Development and Economic Analysis of the Dehydrocooling Process • to develop and assess a method for freezing and drying fresh fruits and vegetables in terms of engineering requirements, energy needs, costs and product characteristics	M. Le Mageur	University of Alberta — Edmonton	60,566
Economic Assessment of Alternative Brush Control • to provide an economic assessment of methods analyzed in a former Farming for the Future research project ("Comparison of Brush Control Methods for the Development and Maintenance of Grazing Lands", A.W. Bailey)	M.L. Lerohl	University of Alberta — Edmonton	15,225
Efficacy of Selected Laundry Practices Used by Alberta Farmers in Removing Pesticide Residues from Clothing • to determine laundry practices and problems encountered by farmers in removing pesticide residues from clothing and to develop safe laundry procedures for pesticide-contaminated clothing	N. Kerr	University of Alberta and Alberta Agriculture — Edmonton	43,812
Evaluating Debt Contracts for Alberta Farmers: A Sensitivity Analysis • to study the ability of long-term farm debt instruments to reduce the risk to Alberta farmers and ranchers in order to develop credit and long-term debt policies appropriate to the agricultural sector	R.G. Aukes	University of Manitoba — Winnipeg	23,670

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION/ LOCATION	FUNDING 1984/85
Ruminants			
Determination of the Efficacy of Methods Used to Fertility Test Beef Bulls to establish the accuracy of available selection criteria (scrotal circumference, libido and seminal quality traits) for predicting fertility of young beef bulls used for multiple-sire breeding under range conditions	G.H. Coulter	Agriculture Canada — Lethbridge	62,000
Pathogenesis of "Nervous" Coccidiosis of Cattle to determine the cause, treatment and prevention of "nervous" coccidiosis in cattle	J.E.C. Bellamy	Western College of Veterinary Medicine — Saskatoon	30,000
Studies of the Endocrinology and Seasonality of Ovulation and Estrus in the Ewe to investigate the role of progesterone and daylength patterns controlling seasonality in ewes	N.C. Rawlings	Western College of Veterinary Medicine — Saskatoon	27,000
Ralgro Effects on Production Traits, Carcass Yield and Meat Quality of Young Bulls to determine whether Ralgro treatment in bulls from 3 to 6 months of age will reduce aggression and sexual interactions amongst feedlot bulls and the adverse meat quality caused by shipping and handling stresses	J.A. Newman	Agriculture Canada — Lacombe	35,000
Effects of Barley Bulk Density and Processing Method on Feedlot Performance of Finishing Beef to compare average daily gain, average daily dry matter intake and feed consumed per unit gain for yearling beef steers fed finishing diets formulated with light, medium and heavy barley and to develop a price relationship, based on animal performance, between bushel weight and feeding value to aid in grain purchasing decisions by commercial feedlots	R.E. Grimson	Lakeside Research — Brooks	38,000
Bovine Respiratory Disease in Alberta Feedlots to assess managerial and environmental circumstances which increase or decrease the risk of respiratory disease in feeder cattle and to identify management practices to be avoided and those which should be recommended to the feedlot industry for the control of respiratory diseases	T.L. Church S.D. Acres	Alberta Agriculture — Edmonton and Veterinary Infectious Disease Organization — Saskatoon	115,000
Bovine Respiratory Disease: Virus-Bacterial Interactions to develop better vaccines against the viral agents which cause Shipping Fever in cattle	L.A. Babiuk	Western College of Veterinary Medicine — Saskatoon	64,000
Bovine Enteric Viruses: Use of Monoclonal Antibodies to Identify Neutralizing Antigens to test the feasibility of using monoclonal antibodies to protect calves from viral agents and to characterize important viral antigens	L.A. Babiuk	Western College of Veterinary Medicine — Saskatoon	30,000
Effect of Nutrients on Reproductive Function to explore the interaction between specific nutrients and reproduction in cattle	J.G. Manns	Western College of Veterinary Medicine — Saskatoon	57,700
Field Testing of an <i>E. coli</i>-Rotavirus-Coronavirus Vaccine for Calf Scours to field test for safety and efficacy an <i>E. coli</i>-rota-coronavirus vaccine for prevention of calf scours	S.D. Acres	Veterinary Infectious Disease Organization — Saskatoon	71,000
Identification and Purification of Protective <i>Pasteurella haemolytica</i> Antigens for Use as a Shipping Fever Vaccine to identify the protective component(s) of <i>P. haemolytica</i> extracts against pneumonic pasteurellosis in calves	T.J.G. Raybould	Veterinary Infectious Disease Organization — Saskatoon	62,000

PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION/ LOCATION	FUNDING 1984/85
Mechanism Mediating Ruminal Stasis in Ruminal Lactic Acidosis (Grain Overload) to reveal the mechanism(s) mediating loss of forestomach motility in ruminants suffering from ruminal lactic acidosis in order that an effective treatment for preserving this motility can be developed	E.C. Crichlow	Western College of Veterinary Medicine — Saskatoon	23,000
Investigation of Depression and Death in Scouring Calves Caused by Acidosis: Pathogenesis and Treatment to study the pathogenesis and treatment of acidosis in order to improve the therapy of scouring calves one to six weeks old	J.M. Naylor	Western College of Veterinary Medicine — Saskatoon	26,000
Evaluation of New Protein Systems for Dairy Cows to test the validity and commercial application of new protein systems in a large-scale feeding trial with lactating dairy cows	J.J. Kennelly	University of Alberta — Edmonton	65,000
Efficiency of Utilization of Forage Energy to determine if and why acetate is poorly utilized for energy gain when a high roughage ration is fed and to examine other reasons for the low efficiency of roughages by growing and fattening livestock	G.W. Mathison	University of Alberta — Edmonton	35,000
Field Testing the University of Alberta Beef Synthetic Bulls to field test the Beef Synthetic bulls developed at the University of Alberta ranch as a sire herd and to produce crossbred females to be used as a maternal breed type for commercial beef production	M. Makarechian	University of Alberta — Edmonton	10,000
Livestock Growth and Meat Production to evaluate the effects of pre- and post-weaning growth parameters (weight and gain) on reproductive performance of heifers calving at two years of age, to develop an index based on body weight and gain measurements, and to find the optimum index range for achieving maximum reproductive efficiency	M.A. Price	University of Alberta — Edmonton	55,000
Foraging Efficiency of Wapiti to develop criteria for selecting an appropriate land base for wapiti (elk) farming and appropriate methods of range improvement and seasonal supplementary feeding	R.J. Hudson	University of Alberta — Edmonton	27,000
Sulphur Dioxide Preservation of Damp Feed Grain to ascertain the need for inclusion of an excretable cation with sulphur dioxide-treated grain in order to maximize utilization and to measure the feeding value and feasibility of sulphur dioxide-treated high moisture grain stored in a plastic enclosure	L.P. Milligan	University of Alberta — Edmonton	29,000
Rumen Particle Size Reduction and Movement to quantify the importance of chewing and fermentation in accomplishing particle size reduction in rumen digesta	L.P. Milligan	University of Alberta — Edmonton	36,000
Nuclear Magnetic Resonance (NMR) Examination of Forages to define and refine a rapid, reliable and simple method of analyzing forages for digestibility, voluntary intake, energy utilization, etc., using high resolution ^{13}C-NMR (a non-destructive method of chemical identification and measurement)	L.P. Milligan R.M. Eloffson R.D. Weisenburger	University of Alberta, Alberta Research Council and Alberta Agriculture — Edmonton	40,000
Regulation of Skeletal Muscle Protein Growth in Cattle to characterize factors which regulate protein turnover in farm animals and to quantify the effects of these factors on rates of skeletal muscle protein synthesis and degradation and to explain the mechanisms involved	J.R. Thompson	University of Alberta — Edmonton	54,000
Nutrient Effects on Energy Metabolism, Appetite and Cold Tolerance to determine the effects of manipulating nutrient intake on the appetite, energy expenditure and cold tolerance of pigs and calves during winter	R.J. Christopherson	University of Alberta — Edmonton	26,000
Cold Resistance in Cattle to determine the detrimental influences of the winter climate on Alberta's cattle industry and to recommend cattle selection, feeding and management practices in order to minimize losses in efficiency	R.J. Christopherson	University of Alberta — Edmonton	38,000

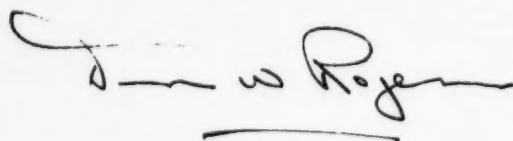
PROJECT TITLE AND OBJECTIVE	RESEARCH MANAGER	INSTITUTION/ LOCATION	FUNDING 1984/85
Influence of Temperature on Protein and Amino Acid Digestion in Ruminants to determine the effect of a cold environment on the net uptake of amino acids by the digestive tracts of ruminant animals	R.J. Christopherson	University of Alberta — Edmonton	31,000
Microbial Digestion of Straw Chemically Treated and Supplemented to Improve Its Nutrient Yield for Ruminants to develop chemical pretreatments and supplementation methods to enhance the digestion of straw by rumen bacteria, thus transforming barley straw into an effective ruminant feed	K.-J. Cheng J.W. Costerton	Agriculture Canada — Lethbridge and University of Calgary — Calgary	34,000
Effects of Prebreeding Exposure to Bulls on the Reproductive Performance of Beef Heifers to examine the effects of the presence of epididymectomized bulls on the calving date and reproduction rate of heifers	M. Makarechian	University of Alberta — Edmonton	10,000
Factors Influencing Reproductive Efficiency of Beef Cattle to study relationships between testes size, libido score and semen quality and quantity and their effect on natural service fertility of bulls in pasture and to investigate factors such as weight, age, pre- and post-weaning gain on testicular development	M. Makarechian B. Callagan	University of Alberta and Alberta Agriculture — Edmonton	15,000
Effects of Early Weaning on Post-Weaning Performance of the Calf and Dam to study the possible interaction effects of weaning date and breeding group on post-weaning performance of calves and cows	M. Makarechian D.B. Karren	University of Alberta — Edmonton and Alberta Agriculture — Red Deer	12,500
Economic Analysis of the Impact of Delayed Breeding of Dairy Cows on Milk Production and Herd Health to study the influence of delayed rebreeding on milk production, the productive life of dairy cows, and the economic returns to dairy producers	J.J. Kennelly	University of Alberta — Edmonton	55,000
Special Crops			
Development of Sugarbeet Handling Procedures that Reduce Sugar Losses During Sugarbeet Harvest and Storage to determine the effect of a truck filler on beet weight loss due to breakage and sugar loss during a prolonged period of storage, and to determine the relationship between root water status (turgidity) and beet damage with and without the use of a truck filler	P. Bergen J. Vaselenak	Alberta Sugar Company — Taber and Alberta Sugarbeet Growers Association — Lethbridge	24,100
Rooting of <i>In vitro</i>-Produced Shoots of Saskatoon (<i>Amelanchier alnifolia</i>) to consistently produce high quality roots on 90 percent of the Saskatoon shoots produced <i>in vitro</i> and to prevent shoots from going dormant after rooting	R.E. Harris	Roal Propagating Laboratory — Victoria	25,680
Field Production of Cut Flowers for Alberta Markets to assess the possibility of replacing imported flowers with quality Alberta products for the maximum time Alberta growing conditions will allow	B.J. Godwin	Olds College — Olds	9,900
The Influence of Physiological Age of Seed Tubers on the Yield of Alberta Potatoes to determine the variation in physiological age of seed potatoes used by Alberta growers and to correlate physiological age differences with tuber yields	W.T. Andrew	University of Alberta — Edmonton	24,900
Alternate Crop Varietal Development: Irrigated Soybeans and Dryland Safflower to develop soybean and safflower varieties suitable for Alberta conditions	H.H. Muendel	Agriculture Canada — Lethbridge	65,900
Regional Potato Cultivar Evaluation to breed potato varieties with early maturity, disease and nematode resistance, superior and stable yield and desirable processing traits	D.R. Lynch	Agriculture Canada — Lethbridge	80,000

AGRICULTURAL RESEARCH COUNCIL OF ALBERTA FARMING FOR THE FUTURE PROGRAM AUDITOR'S REPORT

To the Members of the Agricultural
Research Council of Alberta

I have examined the balance sheet of the Agricultural Research Council of Alberta Farming for the Future Program as at March 31, 1984 and the statement of revenue, expenditure and unexpended funds for the year then ended. My examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as I considered necessary in the circumstances.

In my opinion, these financial statements present fairly the financial position of the Program as at March 31, 1984 and the results of its operations for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

A handwritten signature in dark ink, appearing to read "J. W. Royen", with a horizontal line underneath.

Edmonton, Alberta
September 10, 1984

F.C.A.
Auditor General

AGRICULTURAL RESEARCH COUNCIL OF ALBERTA FARMING FOR THE FUTURE PROGRAM

Balance Sheet As at March 31, 1984

Statement A

	1984	1983
ASSETS		
Current:		
Deposits in trust (Note 3)	\$ 1,461,258	\$ 1,544,785
	\$ 1,461,258	\$ 1,544,785
LIABILITIES		
Current:		
Research grants payable	\$ 958,892	\$ 931,200
Holdbacks payable	88,478	9,965
Management fees payable	51,677	35,316
Due to the Alberta Heritage Savings Trust Fund	8,815	2,420
	1,107,862	978,901
Unexpended funds, Statement B	353,396	565,884
	\$ 1,461,258	\$ 1,544,785

The accompanying notes are part of
these financial statements.

Statement of Revenue, Expenditure and Unexpended Funds For the Year Ended March 31, 1984

Statement B

	1984	1983
Revenue		
Contributions from the Province of Alberta:		
Alberta Heritage Savings Trust Fund (Note 4)	\$ 7,422,684	\$ 7,496,417
Expenditure		
Research grants, Schedule 1:		
Universities	3,802,080	3,041,541
Other	943,352	192,699
Projects administered by the		
Alberta Research Council, Schedule 2	2,155,324	3,279,135
Research grants under the Graduate Student		
Research Support Program, Schedule 3	118,624	117,350
Research grants under the On-Farm		
Demonstration Program, Schedule 4	301,022	141,493
Management fees	257,365	174,005
Supplies and services	57,405	—
	7,635,172	6,946,223
Excess of revenue over expenditure	(212,488)	550,194
Unexpended funds at beginning of year	565,884	15,690
Unexpended funds at end of year	\$ 353,396	\$ 565,884

AGRICULTURAL RESEARCH COUNCIL OF ALBERTA FARMING FOR THE FUTURE PROGRAM

NOTES TO THE FINANCIAL STATEMENTS March 31, 1984

Note 1	Authority	The Farming for the Future Program operates under the authority of the Department of Agriculture Act, Chapter D-12, Revised Statutes of Alberta 1980. Pursuant to section 6 of the Act, the Program was established by Ministerial Order under the administration of the Agricultural Research Council of Alberta.																			
Note 2	Significant Accounting Policies	<i>General</i> Research grants are recorded in these financial statements when grants have been approved for payment by the Minister of Agriculture and conditions of the grants have been formally accepted by the researchers. Unexpended balances of grant funds held in researchers' accounts are not reflected in these financial statements. <i>Changes in Financial Position</i> A statement of changes in financial position is not provided as disclosure in these financial statements is considered to be adequate. <i>Administration Expenses</i> Certain administration expenses are provided by the Province of Alberta at no cost to the Program, and accordingly are not reflected in these financial statements.																			
Note 3	Deposits in Trust	Deposits in trust consist of deposits held as follows: <table><tr><td></td><td>1984</td><td>1983</td></tr><tr><td>The University of Alberta</td><td>\$1,347,243</td><td>\$ —</td></tr><tr><td>General Trust Account,</td><td></td><td></td></tr><tr><td>Province of Alberta</td><td>97,293</td><td>12,385</td></tr><tr><td>Alberta Research Council</td><td>16,722</td><td>1,532,400</td></tr><tr><td></td><td><u>\$1,461,258</u></td><td><u>\$1,544,785</u></td></tr></table>			1984	1983	The University of Alberta	\$1,347,243	\$ —	General Trust Account,			Province of Alberta	97,293	12,385	Alberta Research Council	16,722	1,532,400		<u>\$1,461,258</u>	<u>\$1,544,785</u>
	1984	1983																			
The University of Alberta	\$1,347,243	\$ —																			
General Trust Account,																					
Province of Alberta	97,293	12,385																			
Alberta Research Council	16,722	1,532,400																			
	<u>\$1,461,258</u>	<u>\$1,544,785</u>																			
Note 4	Contributions from the Province of Alberta	The Appropriation (Alberta Heritage Savings Trust Fund, Capital Projects Division) Act, 1983 provided for payments to the Program to a maximum of \$7,500,000 for the year ended March 31, 1984 (1983 \$7,500,000). This provision which enabled the Program to receive funds up to the stated maximum lapsed at March 31, 1984.																			
Note 5	Capital Assets	Pursuant to agreements between the Council and two research agencies, The University of Alberta and the Alberta Research Council, capital assets purchased from research grants remain the property of the Province of Alberta. At March 31, 1984 the cost of such capital assets was approximately \$1,467,000 (1983 \$1,151,000).																			
Note 6	Commitments	As at March 31, 1984 the Program had commitments totalling approximately \$3,442,560 with respect to unadvanced amounts on grant applications approved by the Council but where the conditions had not been formally accepted by researchers or payments approved by the Minister of Agriculture.																			
Note 7	Approval of Financial Statements	These financial statements were approved by management on September 10, 1984.																			

AGRICULTURAL RESEARCH COUNCIL OF ALBERTA FARMING FOR THE FUTURE PROGRAM

Schedule of Research Grants For the Year Ended March 31, 1984

Schedule 1

	1984	1983
Universities:		
The University of Alberta	\$ 3,303,280	\$ 2,100,491
The University of Saskatchewan	337,700	729,450
The University of Toronto	83,900	74,000
Queen's University	41,000	47,000
The University of Manitoba	29,500	68,300
The University of Calgary	6,700	2,300
The University of Guelph	—	20,000
	3,802,080	3,041,541
Other:		
Veterinary Infectious Disease Organization	701,607	—
Monenco	65,581	—
Pedology Consultants	50,000	—
Alberta Livestock Transplants Ltd.	35,000	—
Applied Research and Development	30,514	—
Olds College	20,000	—
Norwest Soil Research Ltd.	17,600	23,500
Fairview College	13,100	17,400
C.W. Farmland Reclamation Ltd.	6,900	15,000
Pirker Apiaries	3,050	3,049
Western Cooperative Fertilizers Ltd.	—	57,850
Vertec Industries Ltd.	—	35,000
P.O.S. Pilot Plant Corp.	—	31,500
Alberta Soil and Feed Analysis Ltd.	—	5,000
Chinook Applied Research Association	—	4,400
	943,352	192,699
	\$ 4,745,432	\$ 3,234,240

Schedule of Research Grants for Projects Administered By the Alberta Research Council For the Year Ended March 31, 1984

Schedule 2

	1984	1983
Canada Department of Agriculture:		
Lacombe	\$ 484,348	\$ 274,200
Beaverlodge	416,825	997,885
Lethbridge	390,486	512,900
Saskatoon	87,350	462,150
Melfort	61,900	71,000
Fort Vermilion	40,000	—
Vancouver	38,500	37,500
Winnipeg	23,600	—
Agassiz	21,000	10,400
Brandon	—	31,000
Alberta Department of Agriculture:		
Edmonton	269,780	39,000
Lethbridge	130,535	275,000
Brooks	112,000	151,000
Lacombe	79,000	256,000
Alberta Research Council	—	161,100
	\$ 2,155,324	\$ 3,279,135

AGRICULTURAL RESEARCH COUNCIL OF ALBERTA

FARMING FOR THE FUTURE PROGRAM

Schedule of Grants for Projects Under the Graduate Student Research Support Program For the Year Ended March 31, 1984

Schedule 3

	1984	1983
The University of Alberta	\$102,324	\$ 97,550
Western College of Veterinary Medicine	9,500	19,800
The University of Calgary	6,800	—
	\$ 118,624	\$ 117,350

Schedule of Grants For Projects under the On-Farm Demonstration Program For the Year Ended March 31, 1984

Schedule 4

	1984	1983
Region:		
Fairview	\$ 74,984	\$ 19,932
Lethbridge	68,302	29,843
Barrhead	63,039	25,257
Vermilion	42,683	14,150
Red Deer	26,778	36,986
Airdrie	25,236	15,325
	\$ 301,022	\$ 141,493

STATISTICAL TABLES

**Distribution of Research Program Projects and Estimated Funding
by Institution**

**FIRST MANDATE
1979/84**

Institution	Number of Projects	Joint Involvement*	Funding Awarded	Percent of Total Awarded
Agriculture Canada	51	5	\$ 7,006,208	31.7
Alberta Agriculture	20	5	3,786,995	17.1
Alberta Research Council	2	3	394,200	1.8
Colleges	2	—	50,500	0.2
Private Industry	17	1	666,800	3.0
Queen's University	1	—	138,000	0.6
University of Alberta	73	5	7,626,722	34.5
University of British Columbia	1	1	37,500	0.2
University of Calgary	—	4	—	—
University of Guelph	1	—	20,000	0.1
University of Manitoba	6	—	236,010	1.1
University of Toronto	2	—	225,900	1.0
Veterinary Infectious Disease Organization	7	1	595,600	2.7
Western College of Veterinary Medicine and University of Saskatoon	16	2	1,337,540	6.0
TOTAL	199	27	\$22,121,975	

*Funds for a project are awarded to only one institution, although some projects are actually joint institutional efforts. When an institution is designated as having "joint involvement" in a project, it is participating in a project for which another institution has been awarded the funding.

**Distribution of Research Program Projects and Estimated Funding
by Program Area**

**FIRST MANDATE
1979/84**

Program Area	Number of Projects	Percent of Total Number	Funding Awarded	Percent of Total Awarded
Cereals and Oilseeds	28	14.1	\$ 5,333,600	24.1
Crop Protection and Entomology	13	6.5	1,597,025	7.2
Forages	32	16.1	3,729,623	16.9
Irrigation	7	3.5	460,735	2.1
Land Resources and Engineering	13	6.5	2,466,205	11.1
Non-Ruminants	22	11.1	1,487,010	6.7
Processing, Transportation, Marketing and Socio-Economics	16	8.0	819,960	3.7
Ruminants	50	25.1	4,870,192	22.0
Special Crops	18	9.1	1,357,625	6.2
TOTAL	199		\$22,121,975	

STATISTICAL TABLES

Distribution of Research Program Projects and Estimated Funding by Year

**FIRST MANDATE
1979/84**

Year	New Projects		Ongoing Projects		TOTAL	
	Number	Funding	Number	Funding	Number	Funding
1979/1980	54	\$2,133,680			54	\$ 2,133,680
1980/1981	31	980,465	51	2,210,642	82	3,191,107
1981/1982	25	761,915	80	3,281,402	105	4,043,317
1982/1983	40	1,594,500	101	4,116,911	141	5,711,411
1983/1984	49	2,439,675	93	4,602,785	142	7,042,460
TOTAL	199					\$22,121,975

Distribution of Research Program Projects and Estimated Funding by Institution

1984/85

Institution	Number of Projects	Funding Awarded	Percent of Total Awarded
Agriculture Canada	23	\$ 1,320,384	30.3
Alberta Agriculture	9	452,750	10.4
Alberta Research Council	3	124,350	2.9
Colleges	1	9,900	0.2
Private Industry	7	208,510	4.8
University of Alberta	43	1,594,234	36.6
University of British Columbia	1	12,984	0.3
University of Manitoba	2	42,170	1.0
University of Toronto	1	58,930	1.4
Veterinary Infectious Disease Organization	4	232,307	5.3
Western College of Veterinary Medicine	8	297,850	6.8
TOTAL	102	\$4,354,369	

Distribution of Research Program Projects and Estimated Funding by Program Area

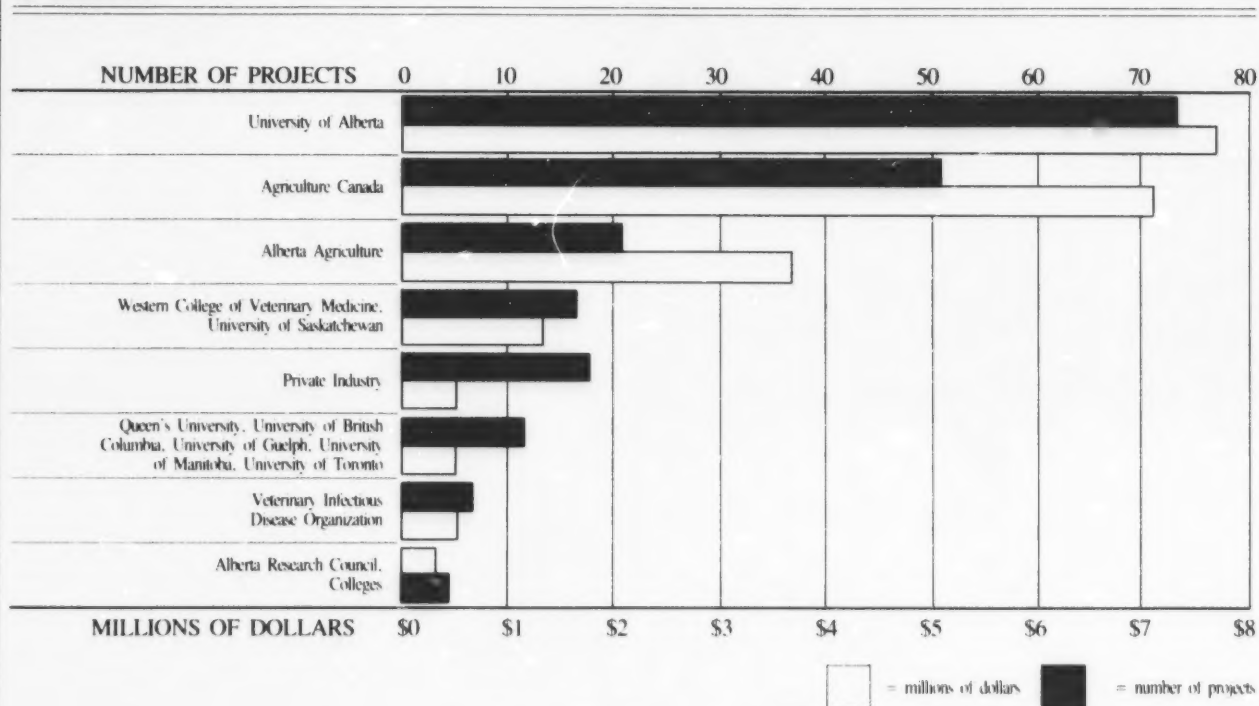
1984/85

Program Area	Number of Projects	Percent of Total Number	Funding Awarded	Percent of Total Awarded
Cereals and Oilseeds	7	6.9	\$ 624,856	14.0
Crop Protection and Entomology	11	10.7	306,034	7.0
Forages	7	6.9	262,800	6.0
Irrigation	4	3.9	209,320	5.0
Land Resources and Engineering	16	15.7	677,766	16.0
Non-Ruminants	7	6.9	284,421	7.0
Processing, Transportation, Marketing and Socio-Economics	14	13.7	541,492	12.0
Ruminants	30	29.4	1,217,200	28.0
Special Crops	6	5.9	230,480	5.0
TOTAL	102		\$4,354,369	

STATISTICAL TABLES

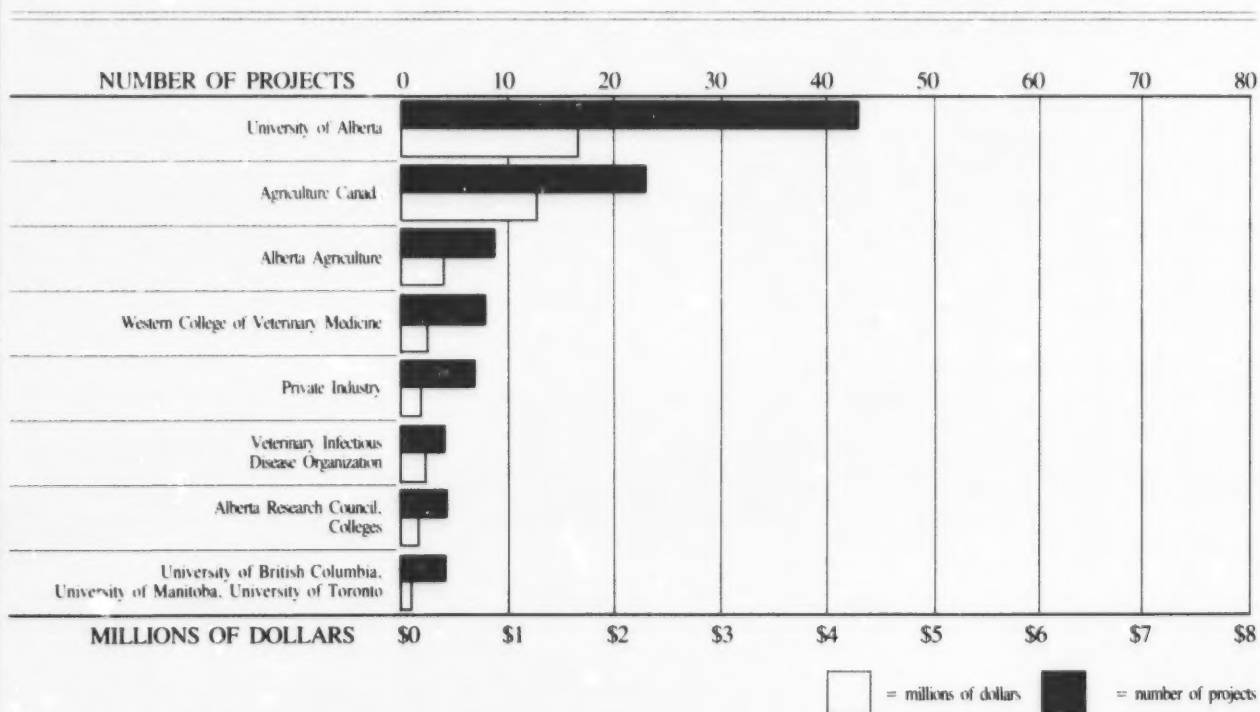
**Distribution of Research Projects and Estimated Funding
by Institution**

FIRST MANDATE



**Distribution of Research Projects and Estimated Funding
by Institution**

1984/1985



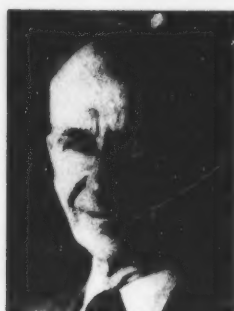
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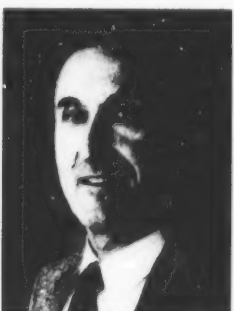
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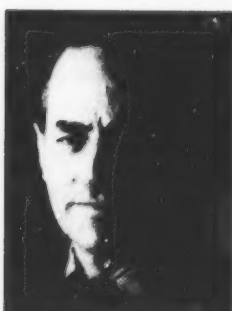
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* indicates new members

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 Mr. G.J. Tajcnar, *High Prairie*

Ms. L.M. Ross, *Fairview*

* indicates Regional Review Committee members who are stepping down in 1984/85

** indicates new Regional Review Committee members who will be replacing those who are stepping down



Additional copies of this report and further information on Farming for the Future are available from:

The Secretary
Agricultural Research Council of Alberta
3rd Floor
J.G. O'Donoghue Building
7000 - 113 Street
Edmonton, Alberta
T6H 5T6

Photography Bryan Buchholz

Editor Evelyn Shapka

Design Don Myhre

Electron microscope pictures courtesy of Agriculture Canada.